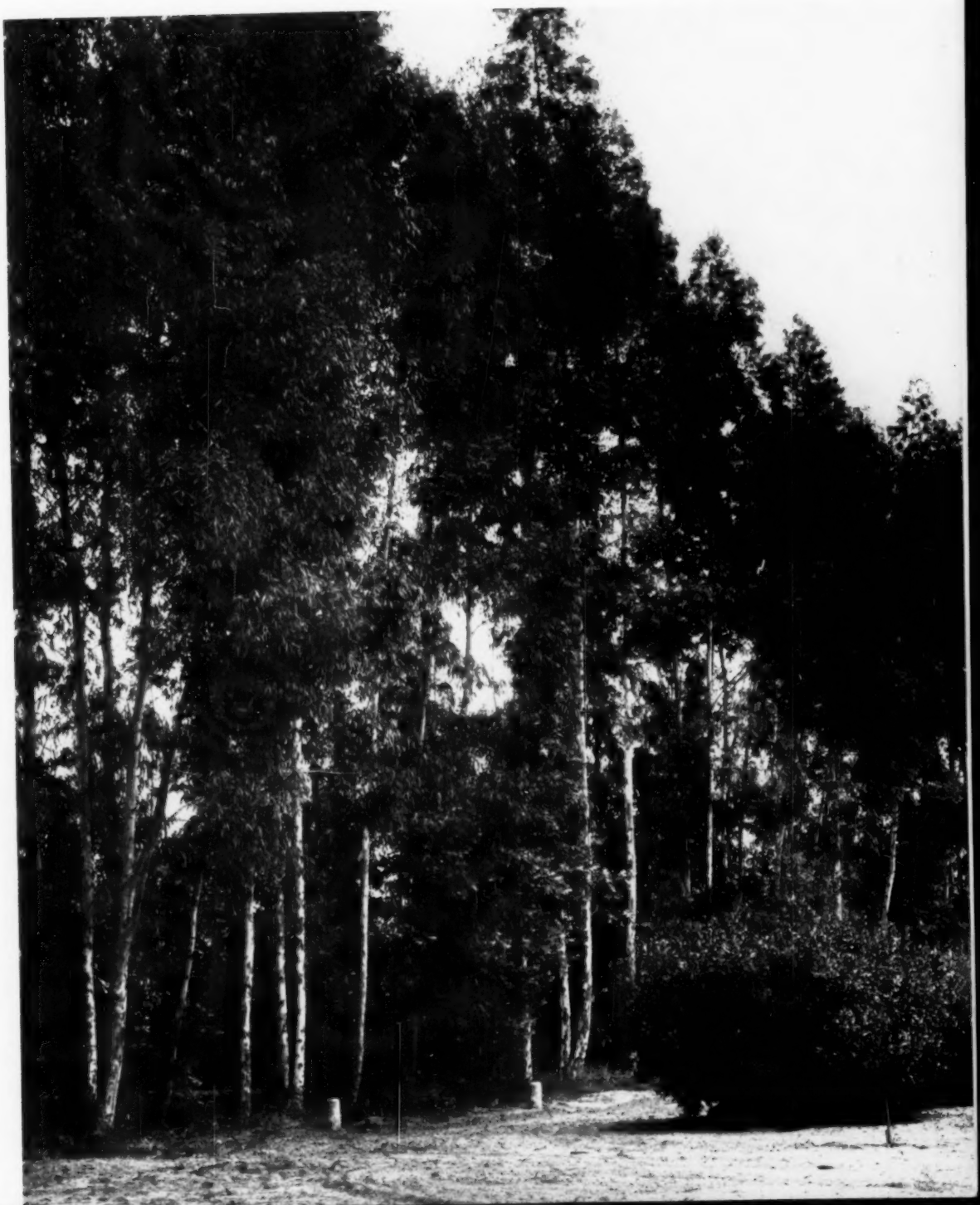
Journal of FORESTRY

AUGUST 1957



SOCIETY OF AMERICAN FORESTERS 1900

Volume 55
Number 8

Just Right!

FOR COMPLETE SATISFACTION USE

WORLD FAMOUS

INDIAN FIRE PUMPS

The first cost is the last cost. No upkeep expense. No chemicals to buy. Only clear water used. That's why so many fire departments are replacing soda acid and other types of extinguishers with INDIANS. Here's a typical comment from our files:

Fire Chief S. W. Griswald of Westbrook, Conn., says: "I cannot praise **INDIANS** highly enough. There is nothing else will match them." Another Chief says: "They are worth their weight in gold."

NO. 80 INDIAN LEVER TYPE Pump and Handle

NO. 90 INDIAN SLIDING PUMP TYPE

For all Class A fires. Fire Chiefs say: *"There is Nothing Else Like INDIAN FIRE PUMPS!"*

Send for Catalog

Both types Approved by Underwriters' Laboratories

D. B. SMITH & CO.

"FOR SEVENTY YEARS THE LEADERS"

407 Main Street, Utica 2, N. Y.

Pacific Coast Branches:

Hercules Equipment & Rubber Co., Inc. San Francisco 7, Calif.
Fred E. Barnett Co. Portland, Ore.
Mill & Mine Supply Co. Seattle 4, Wash.
Halprin Supply Co. Los Angeles 15, Calif.
Fred E. Barnett Co. Klamath Falls, Ore.
L. M. Curtis & Sons Salt Lake City, Utah

Canadian Agents:
Fleck Bros., Ltd. Vancouver, B. C., Canada
C. E. Hickey & Sons, Ltd. Hamilton, Canada
Bison Hardware Co. Toronto, Canada

VOLUME 55 ● NUMBER 8 AUGUST 1957

Journal of Forestry

Editorial Staff

ARTHUR B. MEYER ..... *Editor*

HENRY CLEPPER ..... *Managing Editor*

L. AUDREY WARREN ..... *Business Manager*

Associate Editors

R. KEITH ARNOLD, *Forest Fire*, California Forest and Range Experiment Station, P. O. Box 245, Berkeley 1, Calif.

ROBERT R. BLUMENSTEIN, *Forest and Wood Utilization*, Timber Engineering Company, 4812 Minnesota Avenue, N. E., Washington 19, D. C.

ROBERT E. DILS, *Watershed Management*, School of Natural Resources, University of Michigan, Ann Arbor, Mich.

JOHN W. DUFFIELD, *Silviculture*, Col. W. B. Greeley Forest Nursery, P. O. Box 172, Nisqually, Wash.

S. R. GEVORKIANTZ, *Mensuration*, Lake States Forest Experiment Station, University Farm, St. Paul 1, Minn.

HARVEY J. MACALONEY, *Forest Pathology and Entomology*, Lake States Forest Experiment Station, St. Paul Campus, University of Minnesota, St. Paul 1, Minn.

RALPH W. MARQUIS, *Forest Economics and Policy*, Northeastern Forest Experiment Station, 102 Motors Avenue, Upper Darby, Pa.

CHARLES E. POULTON, *Range Management*, Withycombe Hall 302, Oregon State College, Corvallis, Ore.

CLARENCE W. RICHEN, *Forest Management and Engineering*, Crown Zellerbach Corporation, Public Service Building, Portland 4, Ore.

PHILIP C. WAKELEY, *Forest Genetics and Artificial Regeneration*, Southern Forest Experiment Station, 704 Lowich Building, 2026 St. Charles Avenue, New Orleans 13, La.

LEE E. YEAGER, *Forest-Wildlife Management and Recreation*, Colorado Cooperative Wildlife Research Unit, 243 Forestry Building, Colorado State University, Fort Collins, Colo.

LLOYD THORPE, *Advertising Representative*, 6133 Arcade Building, Seattle 1, Wash.

The JOURNAL OF FORESTRY, established in 1917, is the official organ of the Society of American Foresters, but the Society assumes no responsibility for the statements and opinions expressed by contributors.

Publication office, 425 Mills Building, 17th Street at Pennsylvania Avenue N. W., Washington 6, D. C. Address all correspondence concerning editorial or business matters to JOURNAL OF FORESTRY, 425 Mills Building, 17th Street at Pennsylvania Avenue N. W., Washington 6, D. C. Published monthly. Subscription $7.50 per year; single copies 75 cents. Missing numbers will be replaced without charge provided claim is made within thirty days after date of the following issue.

The editors are not responsible for loss or damage of manuscripts and photographs while in transit or in their possession. All material submitted for publication should be accompanied by return postage.

Copyright, 1957, by the Society of American Foresters. **Entered as second-class matter at the post office at Washington, D. C. Acceptance for mailing at the special rate of postage provided for in the Act of February 28, 1925, embodied in Paragraph 4, Section 412, P. L. and R. authorized November 10, 1927.**

CONTENTS

COVER: A California Eucalyptus Windbreak Protects a Lemon Orchard.
Photo U. S. Forest Service

Exotics Can Succeed in Forestry as in Agriculture ..... *Frank R. Moulds* 563

Annual Variation in the Seed Crops of Loblolly Pine ..... *Karl F. Wenger* 567

Acorn Production on Good, Medium, and Poor Oak Sites in Southern Michigan ..... *Leslie W. Gysel* 570

Homemade Dendrometers ..... *Franklin G. Liming* 575

Some Factors Indicative of Site Quality for Black Cottonwood (Populus trichocarpa Torr. & Gray) ..... *J. Harry G. Smith* 578

Injury to Plants from Rapidly Dropping Temperature in Washington and Northern Idaho ..... *R. Daubenmire* 581

A Program for Detection and Control of Forest Insects and Diseases in Arkansas ..... *Lloyd O. Warren* and *Truman Phifer* 586

Notes 588

Ring Counts in Second-Growth Baldcypress; A Method for Vegetatively Propagating Yellow-Poplar; Anti-Freezing Hoods for V-Notch Weirs.

Points of View 591

Discussion Invited; Further Comments on the Relationship of Forestry and Land Surveying; A Proposed Program for Forestry Education.

Reviews 593

Soil Conservation; Marketing Forest Products in Pennsylvania, Marketing Forest Products from Small Woodland Areas in the Northeast—I, and Marketing Pulpwood in Michigan; Wood-Using Industries of New York; The First One Hundred and Fifty Years: A History of John Wiley and Sons, Incorporated.

Current Literature 596

Society Affairs 597

Forestry News 619

Index to Advertisers 624

Wide open spaces make conifers grow taller, faster

thanks to Dow Herbicides

Pictured above are the results of a well-planned herbicide program—tall, straight, healthy conifers. As seedlings, these conifers got their full share of soil nutrients, moisture and sunlight. Overtopping hardwoods, weed trees, brush and weeds surrendered long ago to control by Dow weed and brush killers.

In addition to better growth, a herbicide program with Dow brush killers makes harvesting easier, and yields a higher percentage of top-grade trees to sell. Dow sales- and technical men can help you get your program started with the right silvicides from the complete Dow line.

There's Esteron® 245 for most hardwood and brush, Kuron® for oak and maple, Esteron Ten-Ten® for aspen, hazel, alder and willow, and other specialized chemicals for every problem. These formulations can be used in any season for foliage or basal treatment; Esteron 245 for frill treatment. They can be applied by air or ground equipment, and with either water or petroleum carriers.

Find out how inexpensive, yet profitable, this part of your forestry management program can be. Write THE DOW CHEMICAL COMPANY, Agricultural Chemical Sales Dept., Midland, Mich.

YOU CAN DEPEND ON DOW

Journal of Forestry

Official Organ of the Society of American Foresters

Exotics Can Succeed in Forestry as in Agriculture

Frank R. Moulds[1]
Principal,
Victorian School of Forestry,
Creswick, Victoria, Australia

MUCH has been written and is known of the failures in tree plantings throughout the world. In his own locality, who does not know of species which have been tried and failed? What forester has not heard of some examples of failures of plantations of exotics, e.g., Scots pine, Austrian pine, and Japanese pine in parts of the United States, and Douglas-fir and redwood in parts of Europe?

Possibly these failures have led foresters, particularly in the United States, to an over-cautious position in the matter of the introduction of exotic species, especially when one considers the successes achieved in agriculture. The economies of whole regions depend on the success achieved with introduced pasture grasses, field crops, fruit trees, and trees grown for other products than timber, e.g., rubber trees in Malaya following the sponsoring by Hooker of the smuggling of seed from the Amazon Valley.

It is proposed to review the successes that appear to be clearly established, to suggest reasons for them, and to list some of the factors that should be considered in developing an exotic forest tree program.

Successful Introductions

A number of outstanding examples of successful introductions now exist with forest trees, and a number of others are very promising, after lengthy trials. In some of these promising cases it may still be too early to be sure, for many species in the past have shown good initial vigor and appearance only to fade out as economic forest trees in the adult stage.

The United States is not the best place in which to expect a wide range of exotic forest tree species. Of all areas of the world, North America is most abundantly endowed with native species, both softwoods and hardwoods, and except in California and parts of the Southwest has never had a strong incentive to experiment and persevere with exotics. The planting which has been done has been largely from scientific motives rather than urgent economic ones. California has, nevertheless, an example of an outstanding success with an exotic species in the case of eucalyptus. Although not used for the purpose for which it was introduced, i.e., lumber production, it has become an invaluable shade and shelter tree. There is at present a revival of interest in eucalypts in California since Masonite has started to use eucalypt pulpwood. This corporation has used eucalypts exclusively in its Australian factories.

Softwood introductions.—In other parts of the world than the United States, softwood timber has been in short supply and consequently most of the work in establishing forest trees outside their natural range has been with coniferous species. The search has been two-fold—for softwood species that will grow faster than native softwoods, particularly on poor soils, e.g., in Europe, and for softwoods to replace poor quality hardwoods and to provide a more versatile timber, e.g., in Australia, New Zealand, South Africa, and South America.

In Europe, Douglas-fir is probably one of the best examples of successful introductions, despite its inglorious and well-known failures in some parts. It is a valuable tree because of its fast growth rate compared with native species, particularly in Britain, Denmark, and north Germany where Boyce (*1*) stated that 45-year-old Douglas-fir is the same size as 100-year-old Scots pine. Boyce has also listed the various pathogenic troubles to which Douglas-fir has been subject and which it has overcome.

King (*10*) has made a plea for more extensive planting in Britain of Douglas-fir, which he claimed at 50 years had 122 percent more volume than Scots pine and 31 percent more than Norway spruce. McDonald (*13*) pointed out that western American conifers account for 23 percent of all conifer plantations in Britain. Sitka spruce covers a larger area than any conifer except Scots pine and has grown well in Britain and other parts of Europe on good sites. As well as this species and Douglas-fir, increasing use is being made of lodgepole pine and grand fir.

The use of lodgepole pine shows some interesting aspects. It has a wide natural range in North Amer-

[1]Visiting professor of forestry, School of Forestry, Louisiana State University, Baton Rouge.

ica from the Yukon to New Mexico and has been extensively planted in Britain, through Western Europe, and into Russia. In summarizing European experience with lodgepole pine, Edwards (*5*) showed that this species generally gives better growth in Finland, Sweden, Norway, Britain, central Europe, and northwest Russia than the native species, especially on poor sites. McDonald (*14*) also emphasized that there is considerable scope for its use in Britain, either pure on the poorest sites where nothing else is worth planting, or in mixture on better sites to assist establishment of rather more valuable species. O'Kelly (*17*) reported also that this species has succeeded in Ireland on sites where spruce and Scots pine were failures.

Eastern white pine showed much promise in Europe until the white pine blister rust, from Asia, caused virtual abandonment of planting. This species is again finding favor where no ribes bushes exist and in such areas has become well adapted to the site and is establishing itself naturally in competition with native species (*1*).

Cupressus species have also been found to grow well under a variety of different conditions when introduced into Latin America and the Mediterranean countries.

Among hardwoods planted in Europe, red oak (*Quercus rubra* L.) grows well in Germany and Belgium on poorer soils than the native oaks, and black locust (*Robinia pseudoacacia* L.) has been a success in central Europe. Poplars have been successfully established in many parts of Europe.

The most outstanding successes, however, with introductions of both hardwoods and softwoods have been in the southern hemisphere—Australia, New Zealand, South Africa, and South America. Growth rates of several pine species, particularly Monterey pine (*P. radiata* D. Don) have been nothing less than phenomenal when compared with native-site growth. Volume increments of 1,000 to 1,200 board feet and higher per acre per year are common. Establishment of this species and others appears to be an accomplished fact. In Australia and New Zealand, multi-million dollar investments have been made since World War II in pulpmills, lumber mills, and veneer plants to utilize the products solely of plantations of exotic pines. Further large-scale planting programs with exotic pines are envisaged by both government and private organizations. Brookes (*2*) has described the *P. radiata* planting program of one of the Australian paper companies, and Scott has described Chilean plantations (*19*).

In many areas of Australia and New Zealand introduced pines are now well into the second rotation, having already provided one highly profiable crop. Despite reservations still held by some foresters about the permanent success of these introductions, southern hemisphere foresters and forest industries are now prepared to invest heavily in them after 60 to 80 years of close observations. The principal softwood species used, in addition to *P. radiata*, are *P. pinaster* Ait., *P. ponderosa* Laws., *P. laricio* Poir., *P. elliottii* Engelm., *P. taeda* L., *P. patula* Schl. & Cham., and in New Zealand, Douglas-fir. New Zealand now has over 750,000 acres of exotic conifers and leads other countries in area of introduced softwoods, with Chile and South Africa each possessing more than half a million acres.

Hardwood introductions.—As far as hardwoods are concerned, the story of successful introductions is more recent, but in some cases nonetheless spectacular. So many good results have been obtained with eucalypts in widely scattered areas in both the northern and southern hemisphere that in 1954 the United Nations F.A.O. organized a eucalypt study tour of Australia which brought together foresters from many parts of the world to observe the large number of species of the genus Eucalyptus in their natural environment. This genus of over 300 species grows in such a diverse range of climates and soils throughout Australia that theoretically it should be possible to select a species for almost any conditions, except extreme cold.

As well as its success with conifers, South Africa has had remarkable success with introduced hardwoods, principally eucalypts and acacias. Several species of the genus Acacia with high tannin content in the bark were introduced into South Africa about 50 years ago and now provide a large part of South Africa's tannin requirements as well as an export trade in tannin even to Australia, from where the acacias were obtained. Eucalypts planted in South Africa have been found to exceed by far the best growth rates shown in their natural habitat. Some of the most spectacular results have been obtained with *E. camaldulensus* Dehn. (formerly *E. rostrata*), *E. globulus* Labill, and *E. saligna* Sm. (*11*). Rotations as short as eight years for pulpwood and twelve years for mill logs are being used. Growth rates of 10 feet in height and 1 inch in diameter per year are the kind of results being achieved, much faster than is shown by these species in their native Australia. South Africa now possesses over 200,000 acres of short-rotation eucalypt forest.

Various species of eucalypts have been successfully established in other countries (*16*), notably Chile, Argentina, Brazil, Bolivia, Ecuador, Uruguay, Peru, India, Pakistan, Ceylon, East Africa, Italy, France, Spain, Turkey, Portugal, Morocco, and Uganda (*3, 6, 9, 15, 20*). Eucalypts have been grown for the essential oil in the leaves, and for the tannin in the bark, as well as for wood production.

Numerous other examples exist of hardwoods which have been successful as introductions, e.g., northern hemisphere species such as poplar, willow, elm, oak, and sycamore when introduced into the southern hemisphere as street trees and ornamentals. There has been no need to plant them for forest purposes.

The successful development of Casuarina in Florida and Puerto Rico, particularly on poor sites, is another example of hardwood adaptability, as also is the exten-

sion of the range of teak into India, Pakistan, Pacific islands, and the Andaman Islands (*22*).

Factors to be Considered in Introduction

The reasons for successes with introductions are not entirely clear, but certain features are of special interest.

1. A fairly intensive type of management has been practiced in many cases to ensure success. In the poorer low fertility soils of Australia, for example, it has been necessary to use superphosphate fertilizers and zinc sprays to obtain satisfactory growth (*21*). Apart from curing and preventing growth disorders, fertilizers have been found to provide exceedingly valuable increases in wood volume production (*18*). In some low rainfall Mediterranean areas and in Bolivia (*20*) irrigation of eucalypts is practiced for the first few years. Luckhoff (*11*) has described the doubling of volume production from eucalypts in South Africa following intensive site preparation, such as plowing and harrowing.

2. In their native range, most forest trees are the natural prey of a number of insects, fungi, animals, birds, and soil organisms which live on the leaves, bark, wood, and roots with a combined effect of greatly reducing the growth rate of the tree. Where unusually rapid growth is shown by introduced species, they are singularly free from pests, e.g., introduced pines in the southern hemisphere, and eucalypts in South Africa and other areas remote from their Australian homeland. Monterey pine in California, by contrast, has a long list of growth-retarding insects and fungi associated with its growth there. The eucalypts, which are evergreens, have at most times of the year in Australia some leaf-eating insect at work cutting down growth rate, often to the extent that almost complete defoliation occurs. The lack of any damage and loss of growth with slash and loblolly pines in Australia from a major natural enemy such as Cronartium, which requires an alternate host (Quercus), is because the rusts have not been introduced and because Quercus does not occur naturally in Australia.

3. With species having a wide and varied natural range such as lodgepole pine and Douglas-fir, geographic provenance is especially important, as is the selection of "elite" trees as seed sources. Edwards (*5*) and Christie (*4*) give illustrations of the manner in which provenance in these two species has governed success or failure of the species when introduced into parts of Europe.

4. Native species on sites with infertile soils or with extremes in the water regime (wet soils or dry soils) may not be the most suitable for timber production. Plant succession will have already provided a tree that grows better than other species that can reach the area but foresters are interested in timber production. It is on poor areas such as these that differences in growth rates show up most markedly. A species that will produce more timber in a given time on such sites has sometimes evolved on a similar site remote from the one in question, and can be profitably used as an introduction.

5. The number of outstandingly successful forest tree introductions is not large. A high proportion of the total successful plantation area throughout the world would be found to consist of Douglas-fir, Sitka spruce, lodgepole pine, Monterey pine, maritime pine, ponderosa pine, Patula pine and various species of the genera Cupressus, Acacia, and Eucalyptus. A common characteristic of these species is that in their natural range or some part of it they occur in pure stands or are regarded as pioneer species. This makes them particularly applicable to pure stand establishment. Other species that have these characteristics should be given special attention for experimental plantation projects.

6. Species have not been extended far in a North-South direction except, of course, for extensions from the northern hemisphere into comparable latitudes in the southern hemisphere, where a further advantage has been the reversal of seasons so that seeds have been used instead of seedlings with the attendant lessened risk of transmitting native pests. The greatest successes in East-West movement have been across wide expanses of water, e.g., the Atlantic, Pacific, and Indian Oceans. Only very local successes have attended efforts to extend the range of a species into contiguous areas. Slash pine, for example, when extended beyond its natural range in southeast United States tends to become more subject to climatic troubles such as ice damage and also possibly greater incidence of Cronartium infection. Hocker (*7*) considered, from the climatic viewpoint alone, that the range of loblolly pine can be extended into contiguous areas only to a very limited extent.

When planting a species in an area remote from its natural range, the conditions should be such that rainfall is higher in the growing season and average temperatures higher, rather than that the climate be drier and cooler as compared with its natural climate, because if free from its native pests it should be given the chance of responding to improved growth conditions.

7. Climatic comparisons should be made between various regions with a view to naming the tree species, having all the above considerations in mind, which might be tested to obtain better growth than that shown by native species. Recent work has been done in this field by Wood (*23*) who has made recommendations for Northwest American species to be planted in Britain based on climatic comparisons. Khan (*8*) has worked along similar lines by comparing the climate of West Pakistan with that of the southwest United States, Mexico, Australia, Mediterranean areas, and West Africa, and recommending species for planting. This is a necessary first step and should include the use of homoclimes such as those of Koppen, Thornthwaite, or Swain or some

modification of these as a basis of climatic comparison. This work must then be followed by plantation trials of adequate extent, with proper tending and protection, matters which have frequently been neglected in previous trials.

There is ample scope for international cooperation in the establishment of test plantations. The United Nations F.A.O. has recognized this with its suggestions (*12*) for species for semi-arid and for humid semi-tropic conditions. The other factors referred to above need to be given adequate consideration in this work.

Further Attention Needed

Foresters must not be afraid to follow in the steps of agronomists and horticulturists in introducing new species. The forester's old fear that artificial plantations are more liable to extermination or severe damage from pests may not be well-founded. Experience is beginning to suggest that the threat may exist just as much with natural forests, for example chestnut and white pine. Foresters must also not fail to take advantage of possibilities brought about by high stumpage values for more intensive management, including cultivation, irrigation, and fertilization, which may be more than paid for by increased volume production per acre. Scientific achievements in increasing crop yields in agriculture and horticulture should and can be more frequently applied in the field of wood growing.

Literature Cited

1. BOYCE, J. S. 1954. Forest plantation protection against diseases and insect pests. F.A.O. For. Devel. Paper No. 3.
2. BROOKES, J. D. 1952. Establishing pine plantations for pulpwood in Australia. Pulp Paper Mag. Can. 53(11): 168-173.
3. CLAUDOT, J. E. 1956. Research and experiments on eucalypts in Morocco. F.A.O. (Rome).
4. CHRISTIE, J. M. 1955. Douglas fir sample plots at Tortworth, Gloucestershire. Rep. For. Res. For. Comm. Lond. 1953-54.
5. EDWARDS, M. V. 1955. Summary of information on *P. contorta*. For. Abstr. 16(1):3-13.
6. GOESS, E. S. R. 1956. Summary report on eucalypts in Portugal. F.A.O. (Rome).
7. HOCKER, H. W. 1956. Climatic factors associated with the distribution of loblolly pine. Ecology 37(4): 824-34.
8. KHAN, M. I. R. 1954. Exotic forest tree species for West Pakistan. Pakistan Jour. For. 4(2):112-7.
9. ————. 1955. The genus eucalyptus, its past and future in West Pakistan. Pakistan Jour. For. 5(4): 202-15.
10. KING, W. B. 1954. Douglas fir. Timber Trade Jour., Lond. 211(4078): 983-5.
11. LUCKHOFF, H. A. 1955. Establishment and regeneration of *E. saligna* plantations in coastal belt of Zululand. Jour. South African For. Assn. No. 25:1-20.
12. MAGINI, E. and TULSTRIP, N. P. 1955. Forest tree species suggested for semi-arid and for humid conditions. F.A.O. For. Devel. Paper No. 5.
13. MCDONALD, J. A. B. 1952. The place of Northwestern American conifers in British forestry. For. Comm, Lond. (6th Brit. Comm. For. Conf., Canada, 1952).
14. ————. 1954. The place of *P. contorta* in British silviculture. Forestry 27(1): 25-30.
15. METRO, A. 1956. Experimental plantings of some eucalypt species in south of France. F.A.O. (Rome).
16. MOULDS, F. R. 1947. Eucalypts and their use in semi-tropical plantings. Trop. Woods. No. 91.
17. O'KELLY, P. F. 1952. *P. contorta* as a forest tree in Ireland. Irish For. 9(1):28-33.
18. RICHARDS, B. N. 1956. Effect of phosphate on *P. taeda* and *P. caribaea* in Queensland. Q'land For. Serv., Brisbane, Austr. Res. Notes No. 5.
19. SCOTT, C. W. 1954. Radiata pine in Chile. Unasylva 8(4), p. 159-164.
20. STEVENSON, D. D. 1953. Growing eucalyptus trees for profit in Bolivia. Jour. Forestry 51:641.
21. STOATE, T. N. 1950. Nutrition of the pine. Comm. For. Bur., Canberra, Austr. Bull. 30.
22. SUBRAMANIAN, B. A. 1956. Teak plantations in the Andamans. Indian For. 82(4):190-4.
23. WOOD, R. F. 1955. Use in Britain of certain northwestern American species. Emp. For. Rev. 34(3):247-51.

Resurvey of Research in the Economics of Forestry

Should another survey be made of forest economics research so as to bring up to date our information on the accomplishments, plans, and problems of research agencies in this field of work? If so, how should the resurvey be designed and when should it be run? These questions are being studied by the Research Committee of the SAF Division of Forest Economics and Policy. The Committee would appreciate having the advice of SAF members. Suggestions should be sent to William A. Duerr, State University College of Forestry at Syracuse University, Syracuse 10, New York.

A survey of research in the economics of forestry was made in 1936 by a subcommittee of the Social Science Research Council. Another was made by the SAF Committee, covering a period through 1947 (see JOURNAL, April 1949, pp. 265-270; also see Chapter VIII of *Research in the Economics of Forestry*, Pack Foundation, 1953, for a supplemented report). If another survey were made soon, the one-a-decade pattern would be continued. (Not considered in this series is the 1955 Kaufert-Cummings report, dealing with forestry research in general and with economic aspects in comparatively little detail.)

The Committee has discussed three types of survey: first, a statistical approach such as that of 1947; second, a directory of studies, agencies, and workers; third, a qualitative appraisal of research trends and needs. Each of the three would be a large undertaking in terms of Committee time and the time of research agencies to whom questionnaires would be sent. The Committee is eager for guidance so that its study, if made, will be most widely useful.

Annual Variation in the Seed Crops Of Loblolly Pine

Karl F. Wenger
Southeastern Forest Experiment Station,
Forest Service,
U. S. Department of Agriculture

ALTHOUGH CONE CROPS of loblolly pine fluctuate widely from year to year, they are more or less uniform over extensive territories in any one year. This uniformity gives rise to the familiar term "seed year." If seed years could be predicted well in advance, the information would be extremely useful in planning cone collections and regeneration measures. Prediction, however, requires an understanding of the basic causes of cone-crop fluctuation, which have received little study because quantitative data are difficult to obtain.

Seed-trapping records in the Bigwoods Experimental Forest[1] from 1946 to 1953 provided sufficient data for studying these causes. Only the records from mature, undisturbed stands were used, because these most clearly reflect the factors affecting size of seed crops. In immature stands, the year-to-year variation of seed crops is modified by the stand's yearly progress toward maturity; in partially cut stands by the effect of release; and in isolated trees by the probability of inadequate pollination. Stands must also be in stable and sympathetic ownership so that they can be withheld from cutting long enough to yield a sufficient number of observations.

Factors Affecting Seed Crops

Seed-crop records were obtained over a period of eight years in the Bigwoods from three stands that satisfied these requirements (Fig. 1). They were well-stocked, although they differed in density, age, origin, and the soils in which they grew. One was an old-field stand of 95 years growing on sandy loam of the Kalmia series. The other two were forest grown, 145 years old, on Craven and Lenoir silt loams. The effects of these stand differences were eliminated from the data by expressing the seed production of each stand as a proportion of the bumper 1947 crop.

Inspection of the data suggested that a large crop in one year was followed by a small crop two years later, and vice versa. The resulting pattern is two good seed years followed by two poor seed years. Regression analysis showed that this relation was highly significant.

This relation suggested that internal physiological factors were a major cause of the annual fluctuations of seed crops. The flower buds formed during one growing season blossom the following spring and produce mature cones and seed two growing seasons later. The cones remain quite small until fertilization occurs in the spring of their second year. Then they develop rapidly, reaching full size in a few months. Thus, a heavy crop in its final season apparently retarded floral differentiation strongly, the inference being that nutrient supplies were used by the maturing crop faster than they could be replenished.

On the other hand, the more or less uniform fluctuation throughout extensive localities suggests weather also as a major factor. In Europe, heavy production of beech mast occurred when the summer of the preceding year was drier and warmer than normal (*1*). In southeastern Virginia, measures to stimulate cone production of loblolly pine must be applied before late June to affect the buds formed during that growing season. (*7*). Consequently, rainfall between the beginning of the growing season and midsummer is more likely to influence fruiting than rainfall at

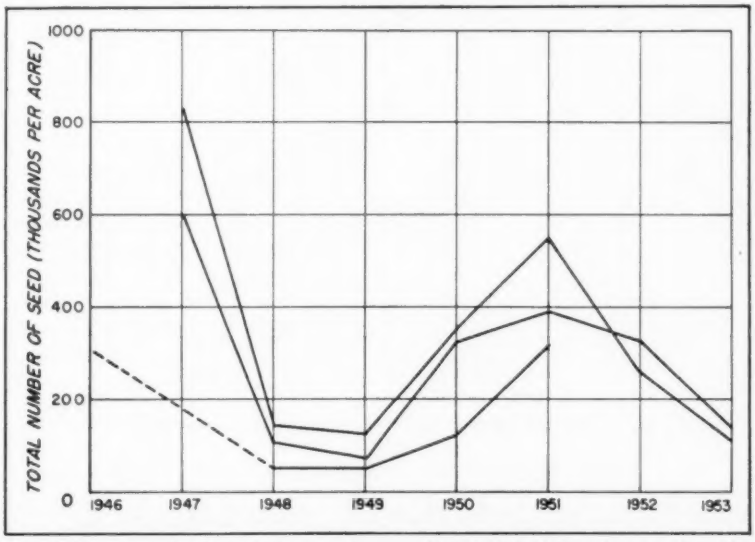


FIG. 1.—Seed production of three mature, undisturbed loblolly pine stands. The lines connect the values for the same stand in succeeding years. No observation was made in one stand in 1947; the dashed line connects the values for 1946 and 1948.

[1]Maintained in Hertford County, North Carolina, by the U. S. Forest Service in cooperation with the Camp Division, Union Bag-Camp Paper Corporation, Franklin, Virginia.

other times of the year. Daily records of rainfall within 3 miles of the Bigwoods Experimental Forest have been kept since March 1949. Records of rainfall before 1949 were available from a weather station at Holland, Virginia, about 20 miles from the experimental forest.

Graphic methods were used to determine the time between April and August when rainfall was most likely to affect fruiting two years later. Differences between the observed seed crops and estimates made by the cyclical relation already found were computed. These were plotted over the rainfall for each month from April to August of two years before, and over every likely 2-, 3-, and 4-month combination of the same five months. The lack of any relation was clear in most cases but seed production seemed to be closely related to June-to-July and May-to-July rainfall. Therefore, each of these values was used in turn in the regression analysis, together with the seed crop of the same year and the interaction between them as the independent variables. Slightly but not significantly more of the variation in seed production was accounted for by the May-to-July rainfall than by the June-to-July rainfall.

The final analysis showed that May-to-July rainfall and its interaction with the seed crop of the same year each accounted for a highly significant portion of the variation in the seed crop two years later. The earlier seed crop by itself did not significantly affect the seed crop two years later after the effects of the two more important variables had been accounted for. The final relation was as follows:

$$Y = -17.9008 + 4.590(b) - 0.0256(bc)$$

in which Y = current seed crop
b = May-to-July rainfall two years earlier
c = seed crop two years earlier

Thus, seed production varied directly with the May-to-July rainfall and inversely with the seed crop of two years earlier (Fig. 2).

The multiple correlation coefficient derived from the data was 0.89, showing that the relations were very close. One of these relations is well supported by observation made in the Duke Forest near Durham, North Carolina (*3*), which show the same negative correlation of seed crops in a 2-year cycle as the Bigwoods observations.

Effects of Moisture on Fruiting

Since adequate soil moisture is required for the absorption of mineral nutrients and nitrogen, the annual fluctuations in loblolly pine seed crops may be caused by variations in the amounts of these substances absorbed. On the other hand, the findings of European workers indicate that carbohydrate reserves are the critical factor in floral initiation, flower buds instead of vegetative buds forming only when a surplus of carbohydrates is present. However, the formation of carbohydrates is affected by soil moisture, since the rate of photosynthesis varies with changes in soil moisture levels (*2*). The transformation and movement of materials within the plant are also influenced by the supply of moisture; consequently, moisture stress in the growing tips may be another factor affecting floral initiation. It seems probable, therefore, that the supply of moisture affects the rate and quantity of a number of processes and substances which are involved in the annual fluctuations of seed crops of loblolly pine.

The effect of rainfall observed in this study suggests that the larger seed crops produced by loblolly pine after crown release (*7*) are more likely a response to increased soil moisture than to increased light, since even dominant trees produce more cones after release. The reduction in transpiration following the removal of competing trees is probably equal to a substantial amount of rainfall.

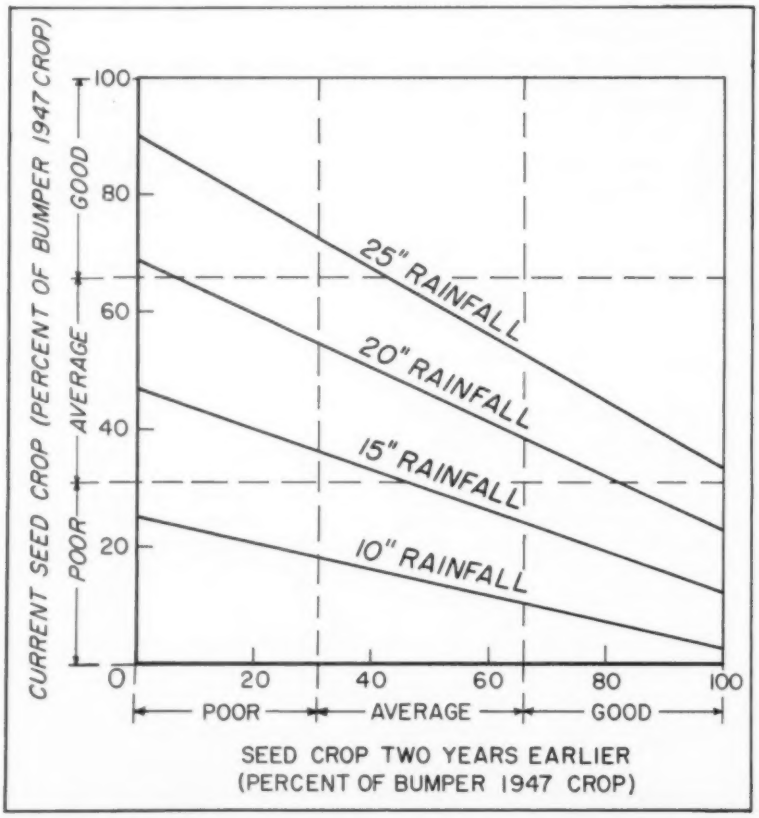


FIG. 2.—Relation between the size of the current seed crop, the May-to-July rainfall two years earlier, and the seed crop two years earlier.

The results of this study also suggest that irrigation might be very profitable in seed orchards. Whether the cycle of large and small crops could be overcome is problematical, but a heavy crop every third and fourth year might be virtually assured, provided no unusual flower or cone losses were caused by insects, diseases, or adverse weather.

Practical Applications

If further trials show that the relation presented above is reliable, seed crop forecasting is an obvious application. The size of the seed crops can be expressed in general terms, such as good, average, and poor, on the basis of a bumper crop in the locality (Fig. 2). A seed crop then could be judged during seed collections and, together with the rainfall for the preceding May-to-July period, used to predict the seed crop two years later.

The predicted crop would have to be examined at critical times between its initial prediction and its maturity, particularly when plans for individual tracts were based on the forecast, because any one of a variety of factors could destroy or substantially reduce a promising crop. Weather is especially critical during flowering, but extreme summer droughts have also reduced or destroyed seed crops (*5*, *6*). Some opinion about insect damage could be formed or more detailed observations made during seed collections in the first autumn of the predicted crop. These agencies do not often destroy or seriously reduce a loblolly pine seed crop in the localities studied, as is shown by the consistent response of the species to partial or complete release (*7*) and by the relation of seed crops to rainfall and fruiting two years earlier.

Little need be said about the advantages of knowing the seed crop two years in advance in planning seed collections or regeneration measures such as seedbed preparation. Not so obvious is the use to which this method of seed crop forecasting can be put in planning seed-tree cuttings. The relation seems to give the most accurate forecast when the current seed crop is heavy. A heavy crop in one year apparently makes a poor crop two years later virtually certain because only an excessive amount of rainfall will increase the prospective crop to the average level (Fig. 2). Since a heavy crop can be predicted a year in advance by the cone-ratio method (*4*), a poor crop can be detected three years before it matures. If the released seed trees needed (*8*) were selected and treated during the winter following this first indication, their increased seed production would be available in the year of the poor crop.

When, on the other hand, the inspection a year in advance shows a poor crop on the trees, the crop three years later cannot be predicted with the same confidence because in that case rainfall has a much greater effect. However, the prospective crop is likely to be at least average, since only seriously deficient rainfall during the critical period will reduce it to the poor level. An average crop will usually result in a satisfactory amount of reproduction if seedbed preparation has been intensive (*8*). In a good seed year, the seedbed created by tractor logging is usually adequate. When the prospect of a good or average crop is not fulfilled because of severe drought or other calamities, which may occasionally happen, planting is the only recourse for promptly establishing a new stand.

Summary

The seed production of three mature, undisturbed stands of loblolly pine in northeastern North Carolina was found to vary inversely with the seed crop and directly with May-to-July rainfall of the second preceding year.

These results suggest that the larger seed crops produced by loblolly pine trees after crown release are a response to increased soil moisture rather than to increased light. They also suggest that irrigation may be very profitable in seed orchards.

If further testing shows them to be reliable, the relations found can be used to forecast seed crops in planning cone collections and regeneration measures. A poor crop can be detected three years in advance, ample time to select and release seed trees so that their increased seed production will be available in the poor seed year.

Literature Cited

1. BUSGEN, M., and MUNCH, E. 1929. The structure and life of forest trees. 436 pp. John Wiley and Sons, Inc., New York.
2. KOZLOWSKI, T. T. 1949. Light and water in relation to growth and competition of piedmont forest tree species. Ecol. Monog. 19: 207-231.
3. POMEROY, K. B., and KORSTIAN, C. F. 1949. Further results on loblolly pine seed production and dispersal. Jour. Forestry 47: 968-970.
4. TROUSDELL, K. B. 1950. A method of forecasting annual variations in seed crops for loblolly pine. Jour. Forestry 48: 345-348.
5. ————. 1955. Loblolly pine crop prospects for 1956. U. S. Forest Serv. Southeastern Forest Expt. Sta. Release. Mimeo.
6. WAKELEY, P. C. 1954. Planting the southern pines. U. S. Dept. Agric. Monog. 18. 233 pp., illus.
7. WENGER, K. F. 1954. The stimulation of loblolly pine seed trees by preharvest release. Jour. Forestry 52: 115-118.
8. ————. 1955. Seed tree requirements in loblolly pine. Southern Lumberman 191(2393): 116-118.

Acorn Production on Good, Medium, and Poor Oak Sites in Southern Michigan[1]

Leslie W. Gysel
Michigan State University, East Lansing

ACORN PRODUCTION is important to the forester for the reproduction of oak and to the wildlife manager for animal food. Both foresters and wildlife managers are therefore concerned with the quantity, quality, animal use, and chemical composition of the acorn crops and the factors which may affect these variables. To provide this information acorn production was determined on sites that were classed as good, medium, and poor for the growth of oak. The quantity and quality of the acorns, primarily as animal food, may provide another criterion for the evaluation of these sites.

Location and Description of the Sample Areas

One of the primary purposes of this study was to determine acorn production on sites having markedly different soils which represent the range of conditions in which oak grows in southern Michigan. The areas selected were close enough together so that climatic differences were relatively minor according to weather station records. The three stands were well-stocked and ungrazed. Tree species sampled in each area are common on similar sites throughout southern Michigan; red oak (*Quercus rubra* L.) and white oak (*Q. alba* L.) were dominant on the good site, black oak (*Q. velutina* Lam.) and white oak on the medium site, and black oak on the poor site.

Good oak site.—This 40-acre oak tract is located 25 miles north of Lansing and 1 mile southeast of Maple Rapids in Clinton County. It is used primarily for silvicultural studies in wood production by the Lake States Forest Experiment Station. The terrain is undulating and well-drained. The soil is a Miami silt loam with the following profile: (1) 6 inches dark gray-brown loam, (2) 8 to 16 inches grayish-yellow silt loam, (3) 3 feet yellow-brown clay loam over (4) a coarse clay loam parent material.

The stand is predominantly red oak and white oak with a few hickories. Some parts of the stand are pure even-aged groups and others are white oak-red oak mixtures of two age classes. Measurements of the dominant and codominant trees sampled in the stand are as follows:

Species	Ave. dia. *In.*	Ave. ht. *Ft.*	Ave. crown area *Sq. ft.*	Age *Years*
Red oak	18	85	601	90-100
White oak	24	83	958	200-300

Medium oak site.—The sample area classified as a medium oak site was located on the Rose Lake Wildlife Experiment Station property, 10 miles northeast of Lansing in Clinton County. The terrain is undulating to gently rolling and well-drained. The soil is a Fox sandy loam with the following profile: (1) 3 inches gray-brown sandy loam, (2) 15 inches yellow-brown sandy loam, (3) 8 inches reddish-brown gravelly sand with a small amount of clay, (4) sand and gravel parent material.

The 10-acre stand is predominantly black oak and white oak with a few scattered pignut hickories. Some parts of the stand are pure even-aged groups and other parts a mixture of white oak and black oak in two age classes. Measurements of the dominant and codominant trees sampled for this study are given in the following table:

Species	Ave. dia. *In.*	Ave. ht. *Ft.*	Ave. crown area *Sq. ft.*	Age *Years*
Black oak	17	75	595	90-100
White oak	22	78	789	150-200

Poor oak site.—This is one of the many wooded parts of the Flat River State Game area located 40 miles northwest of Lansing and 5 miles southeast of Greenville near the southern border of Montcalm County. The terrain is undulating and the soil a Grayling sand with the following profile: (1) 3 inches of gray-brown sand, (2) 25 inches reddish-brown sand over, (3) yellow-brown coarse sand and gravel.

The stand is predominantly pure even-aged black oak with a few scattered white oaks. Stand measurements are as follows:

Species	Ave. dia. *In.*	Ave. ht. *Ft.*	Ave. crown area *Sq. ft.*	Age *Years*
Black oak	10	60	418	60-65

Methods

The first task was to locate reasonably comparable stands on three different sites with approximately the same climatic conditions in southern Michigan. This was done by utilizing areas in the vicinity of those sampled for a previous oak site study (5). The sites were evaluated according to the texture of the subsoil, position of moist layers in the substrata, general topography, and position of the sample areas on the slope.

A comparison of the acorn production of the three sites was based on measurements which were devised to provide an estimate of the maximum yield of seed, primarily to indicate the potential of each site. Acorn production was based on the yield of dominant and codominant trees with well-formed boles and crowns. These were selected after an inspection of the entire stand. For the first two years ten trees of each species were selected for the sampling of acorn production. After an analysis of the variability of the production of individual trees it was found that 15 trees would generally be

[1]Journal Article No. 2045 from the Michigan Agricultural Expt. Sta.

required to maintain a standard error of less than 25 percent of the mean. For the remaining three years of the study 15 trees of each species were sampled.

Acorn production was determined from the number and weight of acorns collected weekly from seed traps 3.3 feet square with a collecting area of 10.9 square feet. The traps were a funnel-type made of treated canvas supported on welded iron pipe frames and four wooden legs (*3*). Two traps and adjacent ground quadrats of equal size were placed under the exposed portion of the crown of each sample tree. Acorns were tallied according to the following categories: sound; damaged by: insects, animals, or malformed because of fungi, bacteria, or undetermined physiological changes. Samples of a known number of sound acorns of each species were weighed at different times throughout the collecting season.

To determine what animals were utiliziling the acorns, observations with binoculars were made during the acorn collection period, and in addition early morning observations were made periodically. Snap traps and automatic photographic units (*4*) were also used to determine the animals utilizing acorns on the ground.

Measurements and observations of stand and site conditions were made in each area. The height, diameter, age, and crown area of the sample trees were determined. In addition, similar measurements were made in one or two well-stocked 1/10 to 1/4 acre plots composed of one species.

The acorn production data were expressed in terms of the total number and weight of all fully developed acorns and also the number and weight of sound acorns. The total number of acorns and sound acorns collected per trap for each species on each site was calculated and increased by 10 percent to compensate for losses by deflection from the traps, a factor determined by testing the traps. The resulting figure is the number of acorns falling from approximately 10.9 square feet of crown area. To make the crown area basis useful for other calculations and easily comparable, it was expanded to the number of acorns per 100 square feet of crown area. The average weight of acorns was determined for each species by multiplying the weight per sound acorn by the number of acorns. To estimate the acorn production on a land area basis, the total crown area of the sample plots was calculated and expanded to a per acre basis. The weight and number of acorns were then expressed on an acre basis according to the ratio of the acorn production per 100 square feet of crown area to the crown area per acre.

Table 1.—Total Weight and Numbers of Fully Developed Acorns Produced Per 100 Square Feet of Crown Area for the Four-Year Period, 1953-1956

Oak site quality	Tree species	Number of acorns	Standard deviation	Weight of acorns
				Pounds
Good	Red oak	610	±165	6.2
	White oak	205	±125	1.1
Medium	Black oak	1374	±248	4.2
	White oak	231	±128	0.9
Poor	Black oak	1225	±191	3.9

Chemical composition of the acorns was determined according to accepted procedures as given in the official methods of analysis of the Association of Official Agricultural Chemists (*1*). Analyses were made by personnel of the Department of Agricultural Chemistry at Michigan State University under the direction of Dr. E. J. Benne. Separate samples for analysis were obtained from three trees of each species on each site. In addition a composite sample from all trees of each species on each site was prepared.

Acorn Production, Quality, and Composition

Number and weight per unit of crown area.—Numbers of the relatively small black oak acorns were slightly greater on the medium than on the poor sites and approximately twice that of the large red oak acorns on the good site (Table 1). There was little difference in the small number of white oak acorns on both the good and medium sites.

In making a comparison of acorn production on the three different sites, the weight of the acorns produced must be considered separately from the numbers because of the weight differences of the three oak species. Fully developed and undamaged black oak acorns weighed approximately 1.4 grams, red oak 4.6 grams, and white oak from 1.8 grams to 3.2 grams according to the area and year. On a weight basis the good site was the most productive as indicated by the sum of the acorn weights for the four year period in Table 1.

The size of the annual crops of acorns according to numbers and weight varied according to the species, the year, and the site (Fig 1). The outstanding difference between species was in the low annual production of white oak and the relatively high production of black oak and red oak. Two years, 1953 and 1956, were complete failures for the white oak. For two consecutive years, 1954 and 1955, the production of black oak was relatively high. The annual trend of acorn production on all three sites was approximately the same for black oak and red oak. It was similar for white oak on the good and medium sites, but this trend differed from that of the red and black oak for two years, 1953 and 1955.

Acorn production per acre.—In addition to the acorn production per unit of crown area, another variable affecting seed production is the total amount of crown area per unit of land. According to the measurements on well-stocked plots, the crown areas are greatest on the good site and smallest on the poor site (Table 2). The total number of black oak acorns and sound acorns is greatest on the medium

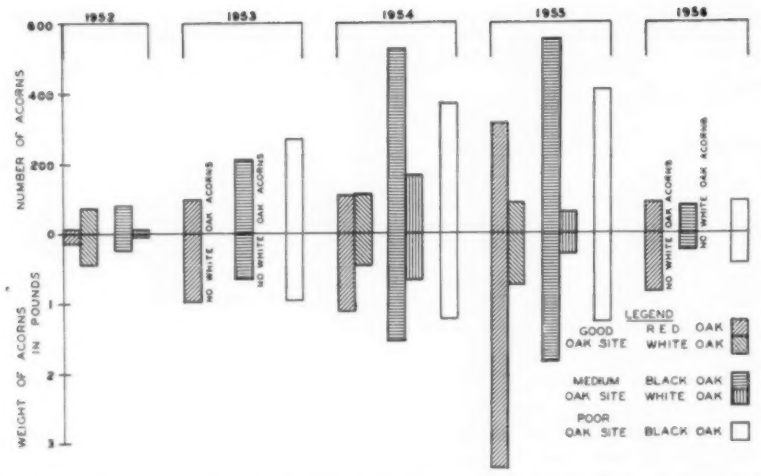


FIG. 1.—Average number and average weight of fully-developed acorns per 100 square feet of crown area.

site. On the poor site, however, only a small portion of a relatively large total was sound. Although the total number of red oak acorns is comparatively low, the proportion of sound acorns is relatively high. Because of a large crown area, the number of white oak acorns is greatest on the good site.

The high productivity of the good site according to weight is marked. The total weight of acorns on the medium site is only slightly greater than on the poor site; however, the weight of sound acorns is much less on the poor site.

Quality of Acorns and Animal Use

A criterion of quality is the proportion of sound acorns. The medium site has a slightly greater percentage of sound acorns than the good site, and the poor site has a low proportion (Table 3). The chief causes of damage were the larvae of various insects on good and medium sites. On the poor site animal damage was relatively high. Actually the "animal damage" can be interpreted as partial estimate of total animal use of the acorns because the acorn count in this category was made from partly eaten acorns and from the remains of the seed coats after the cotyledons and embryos had been completely eaten or removed in the trees; however, no estimate was made of the number of acorns completely removed from the trees.

From counts made in ground quadrats in November after the acorn fall from the trees was complete, it was found that during years of low production, there were generally no sound acorns. During the two years of high production, 1954 and 1955, the proportion of sound acorns remaining varied according to the species, site, and the year. In 1954 approximately ten sound acorns per 100 square feet of ground surface under the trees remained for all species on the three sites with the exception of the medium site black oak which had 90 acorns. In 1955, there were 160 sound black oak acorns per 100 square feet on the medium site and approximately the same number of red oak acorns on the good site. The number of sound acorns of the other species remaining was ten or less per 100 square feet.

Chemical composition.—On the good site, red oak acorns had the highest percentage composition of ash, calcium, and crude fiber, and the lowest composition of protein (Table 4). On the same site white oak was also high in ash, calcium, and nitrogen-free extract, and low in ether extract. On the medium site both the black oak and white oak were high in protein. The chemical composition of the black oak on the poor site was equal to an approximate average of the various constituents of red and black oak on the other sites.

TABLE 2.—CROWN AREA AND AVERAGE ANNUAL ACORN PRODUCTION PER ACRE[1]

Oak-site quality	Tree species	Crown area per acre	Number		Weight	
			Total fully developed acorns	Sound acorns	Total fully developed acorns	Sound acorns
		Sq. ft.			*Pounds*	*Pounds*
Good	Red oak	20,065	30,599	13,957	313	144
	White oak	24,299	12,441	4,447	66	21
Medium	Black oak	18,900	64,921	34,099	200	106
	White oak	20,438	10,905	4,235	43	17
Poor	Black oak	17,525	53,696	12,539	172	40

[1]Based on measurements for the period, 1953-1956.

TABLE 3.—THE PROPORTION OF THE SOUND AND DAMAGED ACORNS FOR THE FIVE-YEAR PERIOD, 1952-1956, FROM COLLECTIONS MADE DURING SEPTEMBER TO DECEMBER

Description of acorns	Good site		Medium site		Poor site
	Red oak	White oak	Black oak	White oak	Black oak
	Percent	*Percent*	*Percent*	*Percent*	*Percent*
Sound	45	27	52	34	24
Damaged by:					
Insects	38	36	26	42	22
Animals	8	17	13	18	47
Fungi, bacteria, other malformations	9	20	9	6	7

Discussion

The three different sites on which acorn production was sampled were selected because of the marked differences in soil texture and horizon formation. The silt and clay soil of the good oak site has a relatively high content of essential plant nutrients and a high moisture retaining capacity (*9*). Oaks grow fast on this kind of site and the boles of most trees are straight with a

TABLE 4.—CHEMICAL COMPOSITION (DRY BASIS) OF ACORNS COLLECTED DURING OCTOBER, 1955

Oak site quality	Tree species	Percentage composition						
		Ash	Calcium	Crude fiber	Ether extract	Protein	Nitrogen-free extract	Phosphorus
Good	Red oak	2.41-2.87	0.051-0.062	3.00-5.39	16.21-22.46	4.72-5.94	65.93-72.20	0.111-0.131
	White oak[1]	2.66	0.064	2.70	4.82	6.54	83.27	0.176
Medium	Black oak	1.63-1.86	0.047-0.052	2.72-3.44	23.06-25.10	6.84-7.14	62.81-66.46	0.122-0.145
	White oak	1.95-2.30	0.047-0.052	2.23-3.19	5.96-6.86	6.35-7.66	81.47-82.20	0.145-0.167
Poor	Black oak	1.73-1.83	0.047-0.052	3.00-3.22	21.03-24.52	5.92-6.59	64.17-68.00	0.124

[1]Composite sample.

large proportion of clear length. It is generally possible to recognize a good oak site by the well-formed red oak and white oak either in pure stands or in mixtures with other species.

The sandy loam of the medium oak site, has a lower content of essential plant nutrients and a lower moisture retaining capacity than the clay soil (*9*). The natural fertility for crops is intermediate to low and the growth of black oak is also intermediate in relation to the growth of the trees of the red oak group in southern Michigan. The majority of the trees are straight although some leaning trees are found. Stands on medium sites are usually predominantly black oak with some white oak, and can be managed for sawlogs. Relatively high squirrel populations may occur in oak stands on medium sites.

The poor site has a deep sandy soil which is low in essential elements, strongly acid in reaction, and low in moisture retaining capacity (*8*). Tree growth is slow, crowns are small, and a high percentage of the stems are crooked, defective, leaning, and limby. Few trees are capable of producing sawlogs. Squirrel production is relatively high and in the area where the trees were sampled the blue jay population is also high.

A complete analysis of the acorn crops from the three different areas should integrate the weight and the number of acorns produced, as well as the quality and the chemical composition. In assessing a value to each of these criteria it is necessary to consider the relative importance of each. This may differ according to the use of the seed. For example, in a woods managed primarily for wood production, at the time of cutting or during the reproduction period, a prime consideration of the forester would be the number of sound acorns. A game manager in a similar area might be interested in all of the criteria.

On the basis of numbers there is little difference between black oak on medium and poor sites and between white oak on medium and good sites. The number of red oak acorns is about half that of the black oak.

In making a comparison of the acorn production of the three different sites, the weight of seed produced is the best criterion for comparing the mass of seed matter produced on the sites. On this basis the good site is predominantly the most productive for both red oak and white oak per unit of crown area because of the greater weight of the seed of both species. On a per acre basis the greater weight of acorns on the good site is more pronounced because of the large crown area of both red oak and white oak. Seed productivity in terms of weight on the medium and poor sites is about the same.

It is difficult to determine the relation of the quality of acorns to the sites. Insect activity in the acorns is apparently related in part to the species of oak. Black oak was less affected by insects than either red oak or white oak on the three sites. Intensity of animal activity can be related to many factors which may or may not be related to site, such as animal food preferences and the availability of other kinds of food. Squirrels appeared to be about equal in numbers on the three sites; however the blue jay population was especially high on the poor site and apparently was the cause of a high proportion of animal damage there.

Most of the loss of sound acorns on the ground was apparently due to animals. According to photographic records with an automatic photographic unit baited with acorns, about 90 percent of the acorns were removed by fox squirrels during the winter months. By mid-November approximately 80 percent of the sound acorns of the three species which originally fell to the ground were removed. Exceptions were the red oak on the good site and black oak on the medium site in 1955; the number of sound acorns of these species remaining on the ground was approximately 32,000 per acre. If 5 percent,[2] or approximately 1,600 of these developed into seedlings, only partial stocking would probably result after a heavy cut in a pure even-aged stand. In other years there were generally less than 2,000 sound acorns per acre on the ground in late fall which might produce 100 seedlings or less per acre.

Differences in chemical composition may be partly due to the inherent quality of the species and partly related to site conditions. The relatively high proportion of nitrogen-free extract and low proportion of ether extract in white oak were also found by Baumgras (*2*) in acorns from another area in Michigan. In a comparison of the acorns from the three sites regardless of species, those from the good site were highest in ash, calcium, and nitrogen-free extract, and lowest in ether extract. Acorns from

[2]This may be a conservative figure. Korstian (*6*) found that 0.37 percent of a crop of black oak acorns from 9 trees remained with normal embryos in the spring or had germinated. From observations of 480 red oak acorns in Iowa, it was found in the spring that all of the unprotected acorns and 99 percent of those covered with leaves had been destroyed, probably by mice; of the acorns planted in the soil, 68 percent were destroyed (*7*).

the medium site had a larger amount of protein than those on good and poor sites. In a determination of food values, the preference of animals and the digestibility must also be considered. From feeding experiments with captive fox squirrels in Michigan, Baumgras (*2*) found that red oak was the least preferred food and that loss of weight and death resulted when acorns of this species were the only food available. The captive squirrels lost some weight on black oak acorns, but gained on a diet of white oak acorns, which were highly preferred.

Summary and Conclusions

From a comparison of estimates of the maximum yield of acorns according to seed trap counts on sites classed as good, medium, and poor for the growth of oak in southern Michigan, the following conclusions were made:

1. The number of black oak acorns on medium and poor sites was approximately double that of red oak on good sites. The number of white oak acorns on good and medium sites was relatively small and approximately the same on both sites.

2. On a weight basis the red oak on the good site was approximately one-third more productive than black oak on medium and poor sites. The weight of white oak acorns, which was approximately the same on good and medium sites, was about one-sixth the weight of red oak.

3. The annual trend of acorn production on all three sites was approximately the same for black oak and red oak. It was approximately similar for white oak on the good and medium sites; however, this trend differed from that of the red and black oaks for two years.

4. The proportion of sound acorns on the medium site was slightly greater than on the good site. The poor site had a low proportion of sound acorns, primarily because of heavy animal use.

5. Red oak and white oak acorns from the good site were highest in ash, calcium, and nitrogen-free extract, and lowest in ether extract. Red oak was also lowest in protein. White oak and black oak acorns from the medium site were highest in protein.

In the oak stands examined during the five year period, most of the acorns were eaten by animals and insects. Animals apparently utilized the greater proportion of the acorns throughout the year. If the three stands are evaluated on the basis of food for squirrels, one of the most common of the animals utilizing the acorns, the white oak-black oak type on the medium site appears to be of greatest value. Acorns of both species on this site are preferred foods, relatively high in quantity and nutritional value.

During one year of the five, enough sound red oak and black oak acorns remained on the good site and medium site, respectively, to develop a partial stocking of seedlings in a heavily cut stand. During the other years, the few sound acorns that remained after the acorn fall would probably produce only a few scattered seedlings per acre.

Literature Cited

1. ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS 1955. Official methods of analysis. Pub. by the Association of Official Agricultural Chemists, Washington, D. C. 1,008 pp.
2. BAUMGRAS, P. 1944. Experimental feeding of captive fox squirrels. Jour. Wildlife Manag. 8(4):296-300.
3. GYSEL, L. W. 1956. Measurement of acorn crops. Forest Sci. 2(4):305-313.
4. ———, and E. M. DAVIS, JR. 1956. A simple automatic photographic unit for wildlife research. Jour. Wildlife Manag. 20(4):451-453.
5. ———, and J. L. AREND. 1953. Oak sites in southern Michigan: their classification and evaluation. Mich. State Col. Tech. Bull. 236.
6. KORSTIAN, C. F. 1927. Factors controlling germination and early survival in oaks. Yale Univ. School of Forestry Bull. 19.
7. KRAJICEK, J. E. 1955. Rodents influence red oak regeneration. Central States Forest Expt. Sta. Note No. 91.
8. U. S. DEPARTMENT OF AGRICULTURE. 1951. Soil survey of Newaygo county, Michigan. U. S. Dept. of Agric., Washington. 68 pp.
9. ———. 1942. Soil survey, Clinton county, Michigan. U. S. Dept. of Agric., Washington. 71 pp.

World Forestry Congress in U. S. in 1960

The Food and Agricultural Organization of the United Nations has approved holding the Fifth World Forestry Congress in the United States in the summer of 1960.

This action followed an invitation to FAO by the United States Government, submitted when the U. S. Forest Service and other forestry groups, including the Society of American Foresters, agreed to help develop the necessary plans and arrangements.

The Congress sessions will be centered in the Pacific Northwest, probably in the State of Washington. In addition, regional tours and field excursions will be available for visiting delegates.

On October 14, 1956, the Council of the Society unanimously adopted a resolution endorsing the Congress in the United States in 1960, and offering the Society's cooperation. For additional details see the JOURNAL OF FORESTRY for January 1957, page 59.

Participation by the Society in the Congress will be handled by the Committee on International Relations, of which Dr. V. L. Harper, U. S. Forest Service, Washington, D. C., is chairman.

As plans for the Congress are developed, they will be reported in full in the JOURNAL.

Homemade Dendrometers

Franklin G. Liming
Forester in charge,
Columbia Forest Research Center,[1]
Central States Forest Experiment Station,
Forest Service,
U. S. Department of Agriculture,
Columbia, Missouri

THE DENDROMETER or growth band (Fig. 1) described here was developed to meet the need for a convenient, inexpensive means of accurately measuring small changes in tree size at short intervals of time. With it, increases or decreases in tree circumference as small as 1/100-inch can be measured accurately. These bands have been used for several years on large and small hardwood and softwood trees during all seasons of the year and have been found very satisfactory.

Materials and Equipment

The materials and equipment needed for making and installing these growth bands are simple and inexpensive. They include: (1) supply of one-half inch aluminum or zinc tape, (2) supply of flexible coil springs about the diameter of a lead pencil, 2½ to 3 inches long, with a modulus of elasticity of 2 to 4 inches per pound, (3) pair of strong scissors for cutting the tape, (4) small-hole paper punch for making holes for attaching springs, (5) knife or similar cutting tool for smoothing the bark, (6) template to use as a guide for making scales on the bands, and (7) a stylus for scratching scale marks on the bands.

The template (Fig. 2-A) consists of two steel plates about 3/16 inches thick and 3 inches wide. The top plate is 4 inches long and the bottom plate is 5 inches long. Accurately machined slots 1/100 inch wide are cut at 1/10-inch intervals along a 3-inch section of one edge of the top plate. The inch slots should be ½ inch deep (width of the tape), the ½-inch slots 7/16 inches deep, and the 1/10-inch slots ⅜ inches deep. This edge of the template is used for making the 1/10-inch scale. Eleven similar slots are cut into the other edge of the top plate at intervals of 9/100 inch. This edge of the template is used for making the vernier scales on the bands. Winged nuts on short bolts attached to the lower plate are used to clamp the band in the template while scratching the scale marks on the bands.

The stylus consists of a small piece of tempered steel about 1 inch long, ¼ inch wide, and slightly less than 1/100 inch thick inserted into a pen holder or some similar handle. The cutting end of the blade of the stylus should be shaped as is shown in Figure 2-B and sharpened like a chisel so that the scratch made by it is as wide as the stylus is thick and just slightly narrower than the slots in the template.

Ease in Making, Installing

The bands can be made in the field and installed in less time than it takes to read the following directions. (A photograph of a complete band is shown in Figure 3.)

1. Remove the loose bark and smooth off any protruding pieces of bark at the place on the tree where the band is to be installed.
2. Cut off a piece of tape at least 7 inches longer than the circumference of the tree. This will be the band.
3. Make a sleeve on the end of the band as shown and described in Figure 4. (This sleeve keeps the overlapping ends of the band in position after the band is installed.)

FIG. 1.—Changes in circumference, increases or decreases, as small as 0.01 inch can be measured accurately with this simple, inexpensive, easy to install, homemade dendrometer.

[1]Maintained in cooperation with the University of Missouri Agricultural Experiment Station.

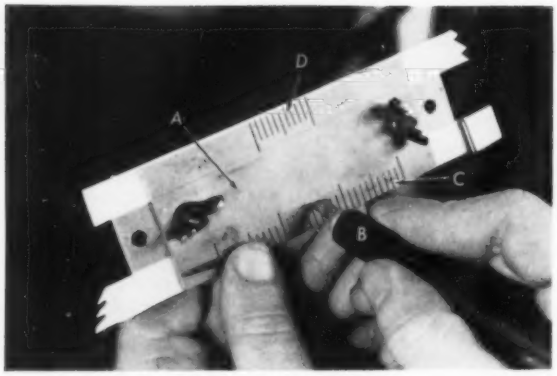


FIG. 2.—The template (*A*) and stylus (*B*) are used to scratch the 1/10-inch scale (*C*) and the vernier (*D*) scale on the band. The ends of the band are held in place by pressure exerted by wing nuts on short bolts fastened to the bottom of the plate.

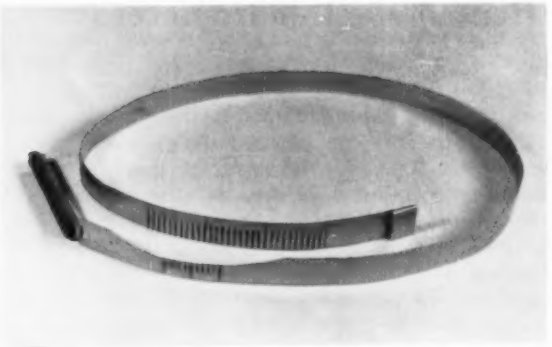


FIG. 3.—A complete band showing location of sleeve, scales, holes for attaching spring, and spring.

4. Place the end of the band in the template with the sleeve end extending about ½ inch beyond the right end of the template (Fig. 2-C). Tighten the wing nuts and with a stylus scratch the 1/10-inch scale marks on the band through the slots in the template.

5. Remove the band and place it around the tree exactly where it is to be installed so the free end passes through the sleeve and extends to your left as you face the tree. Pull the band snug and mark the free end of the band at the point where it crosses the left or zero mark of the 1/10-inch scale. This will be the left end of the vernier scale (Fig. 5).

6. Remove the band and place the *free* end in the template as shown in Figure 2-D. Scratch the vernier scale on the band.

7. Remove the band from the template and, with scissors, cut away the top half of the portion of the band bearing the vernier scale so that the upper half of the 1/10-inch scale will be visible when the band is in place (Fig. 1).

8. With a paper punch, made a hole 1½ inches to the left of the zero end of the vernier scale, cut off the band ⅛ inch beyond the edge of the hole and round the corners. Also punch a hole at the point on the band 5 inches, or the length of the spring plus 2 inches, to the left of the zero end of the 1/10-inch scale. The tension of the spring can be adjusted by locating this hole farther to the right or left.

9. Hook one end of the coil spring into the last hole punched and then place the band around the tree with the free end through the sleeve and pointing to the left as you face the tree.

10. Hook the other end of the spring into the hole in the end of the band. The spring should be strong enough and stretched enough to exert about a ½-pound pull on the ends of the band.

If the above directions have been followed carefully, the spring should hold the band snug against the tree and the scale should read 0.00; *i.e.*, the left or zero mark of the vernier scale should be directly in line with zero mark on the 1/10-inch scale. However, although desirable, it is not necessary that the beginning reading be 0.00 inches.

As the tree increases in size, the spring will be stretched and the overlap of the bands will be de-

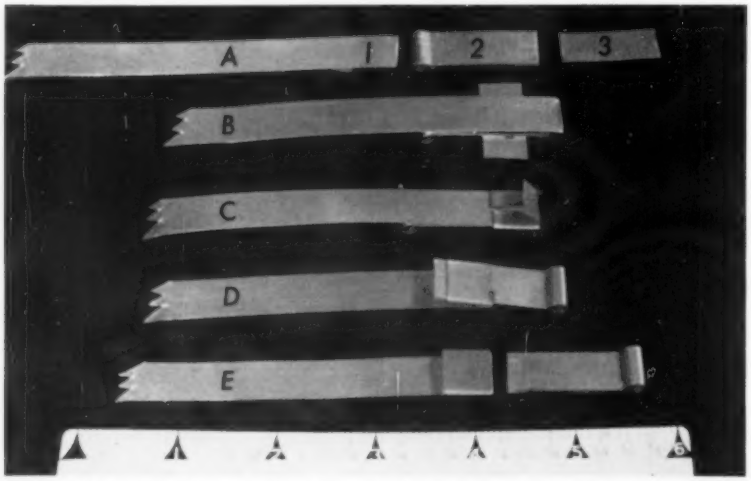


FIG. 4.—Make the sleeve on the end of the band, *A*-1, as follows: (*A*) the sleeve (*A*-3) is made out of a piece of tape 1-1/10 inches long. The spacer (*A*-2) is made out of a 3-inch piece of tape folded as shown. This spacer is used to make the sleeve large enough to allow the overlapping end of the band to pass through without binding, and can be used more than once. (*B*) Assemble the three above pieces as shown. (*C*) Bend the ends of the sleeve piece up and around the spacer and the end of the band, and then bend the protruding end of the band up and over the folded ends of the sleeve. (*D*) Bend the sleeve and the spacer up and over on top of the band and press flat. (*E*) Remove the spacer and the sleeve is completed.

creased by an amount equal to the increase in tree circumference. This increase can be measured to the nearest 1/100 inch. For example, the band shown in Figure 1 has a reading of 0.14 inches. Assuming the beginning reading was 0.00, this means that the circumference of the tree has increased 0.14 inches since the band was installed. Subsequent changes in circumference, increases or decreases, can be determined by changes in the band readings.

Advantages and Disadvantages

These bands have several distinct advantages when compared with most other dendrometers: (1) they are simple to make and can be made and installed in less than 5 minutes; (2) no expensive, delicate, or complicated equipment is needed; (3) the bands are inexpensive and consequently can be used on many trees; (4) installation of the bands involves no injury to the bark, cambium, or wood; and, (5) changes in size at all points around the circumference of the tree are included in the measurements made with the bands.

The bands also have some disadvantages. Occasionally, especially if the spring is too strong or tight, the overlapping portions of the band "stick" together temporarily and must be freed by a slight vertical movement of the overlapping end to get a correct reading Moreover, the bands are not attached permanently to the trees, so care must be taken to see that they are not dislodged by animals, falling branches, etc. And finally, the bands do not work well on trees less than 3 inches in diameter. All in all, however, on the basis of past experience, the advantages far outweigh the disadvantages for use on a large number of trees.

FIG. 5.—Determining the position of the vernier scale on the end of the band. The vernier scale should be placed on the band so that the zero end will coincide with the zero end of the 1/10-inch scale when the band is in place.

SECTION BOX SCORE 1957 MEMBERSHIP

Section	Applications received[1] Aug. 1957	Total 1956	Total 1957
Allegheny	1	58	62
Appalachian	5	58	20
Central Rocky Mountain	0	32	21
Central States	0	42	11
Columbia River	2	77	53
Gulf States	1	79	41
Inland Empire	2	32	14
Intermountain	0	35	5
Kentucky-Tennessee	1	12	6
New England	2	61	37
New York	1	45	34
Northern California	0	67	17
Northern Rocky Mountain	1	31	46
Ozark	3	19	57
Puget Sound	5	44	46
Southeastern	4	92	100
Southern California	0	2	2
Southwestern	0	2	5
Upper-Mississippi Valley	1	72	49
Washington	0	1	10
Wisconsin-Michigan	2	102	30
Totals	31	963	666

[1]Students, Junior, Affiliate, Associate (Initial) grades only.

SCHOOL BOX SCORE 1957 MEMBERSHIP

School	Student applications received Aug. 1957	Total 1956	Total 1957
Alabama Polytechnic Institute	0	6	19
University of California	0	53	10
Colorado State University	0	28	16
Duke University	0	7	3
University of Florida	0	25	5
University of Georgia	3	30	59
University of Idaho	2	21	14
Iowa State College	1	31	18
Louisiana Polytechnic Institute	0	27	1
Louisiana State University	0	22	19
University of Maine	1	13	18
University of Massachusetts	0	20	2
Michigan State University	0	50	9
University of Michigan	1	24	9
University of Minnesota	0	26	27
University of Missouri	0	2	36
Montana State University	1	17	44
State University of New York	0	38	24
North Carolina State College	0	24	1
Oregon State College	2	44	29
Pennsylvania State University	0	35	29
Purdue University	0	36	2
Utah State University	0	28	5
University of Washington	1	21	16
West Virginia University	0	5	19
Yale University	0	13	5
Totals	12	646	439

Some Factors Indicative of Site Quality for Black Cottonwood (Populus trichocarpa Torr. & Gray)[1]

J. Harry G. Smith
Assistant professor,
Faculty of Forestry,
University of British Columbia,
Vancouver

THIS REPORT summarizes field observations made during the summer of 1955 in the vicinity of Agassiz, Chilliwack, Squamish, Pemberton, Quesnel, Prince George, and Terrace, British Columbia, for Western Plywood Company, Ltd. The approach is related to that used by W. Wittich in his discussion of site quality of German poplars in *Das Pappelbuch* by Hesmer (*3*). Detailed discussions of the Lower Fraser River Valley sites are based on 157 0.1-acre plots and measurements of total height, age, and d.b.h. of 287 black cottonwoods.

Requirements for Establishment

Distribution of black cottonwood is limited to situations where bare and moist mineral soil is exposed during the time of seedfall in early summer. Such conditions occur naturally only on fresh alluvial deposits along rivers and streams. Since cottonwood occurs in the earliest stages of succession it will be replaced in time by more tolerant trees, shrubs, or grasses unless a new supply of bare land is provided by flooding or human efforts. Without special treatment during logging, cottonwood stands are replaced largely by brush or by less valuable tree species.

The Influence of Climate

Black cottonwood grows throughout most of British Columbia with the exception of a narrow strip on the eastern part of the Province where it is replaced by balsam poplar (*Populus tacamahaca* Mill). Black cottonwood grows best at low elevations and in the more southerly latitudes where the frost-free period is long. Cottonwoods continue to increase in height and diameter until moisture or temperature become limiting in early fall. The longer summer days of the North, and the hotter and brighter weather of the interior do not compensate for the abundant moisture and long growing season of the Lower Fraser River Valley. Black cottonwoods are damaged by sudden late or early frosts, but are reasonably frost resistant. Black cottonwood is subject to frost cracking and suffers severe damage where sleet storms are common. There appears to be a great variation in wind tolerance among individual trees, but in general the black cottonwoods appear reasonably resistant to strong or constant winds.

The climate of Agassiz in the Lower Fraser River Valley may be used for reference in the rest of this discussion. There the mean annual temperature in degrees Fahrenheit averages 50 within the maximum temperature of 103° F. and a minimum of −13° F. over the past 60 years. The annual precipitation averages 63 inches with an average of 2 inches in each of July and August. The average annual number of hours of bright sunshine is 1,410.

Measures of Site Quality

Growth of cottonwood. — The height, d.b.h., and age attained by cottonwood provide the best indication of the quality of any area for growth of cottonwood. These measurements reflect what actually has taken place over a period of years and represent the synthesis of all factors that have influenced and are likely to affect growth of cottonwood. Measurements of past growth provide a reasonable approximation of increments that may be attained in the future. Measurements may be misleading to the extent that method of cultivation and genetic make-up differ from those of trees that will be grown in the future. Plantation-grown cottonwood should grow much faster than natural stands because plantation spacing will be wide initially and controlled by thinnings. The use of cuttings and careful choice of parent material will give plantations further advantages over natural stands; hence evaluation of site in terms of present growth of cottonwood may be considered to be conservative.

Table 1 is based on estimates of yield reported in Hesmer's *Das Pappelbuch* for plantations of hybrid poplars in Germany. Extensive sampling in the Lower Fraser River Valley of British Columbia has shown that these data are suited to the evaluation of site quality for black cottonwood.

Measurements of height and age or d.b.h. and age of at least two trees are required for each spot to be evaluated. The largest and tallest trees should be measured and care should be taken to ensure that total age is determined. Although

[1]Research Note No. 13, Faculty of Forestry, The University of British Columbia.

TABLE 1.—ESTIMATES OF YIELD FOR PLANTATIONS OF HYBRID POPLARS IN GERMANY[1]

Age in years	Site classes I		II		III	
	Height	D.b.h.	Height	D.b.h.	Height	D.b.h.
	Feet	*Inches*	*Feet*	*Inches*	*Feet*	*Inches*
5	25	—	21	—	16	—
10	47	5.7	43	4.8	33	3.6
15	72	9.5	59	7.1	46	5.9
20	95	12.5	79	9.0	59	6.5
25	111	16.0	92	12.0	72	8.0
30	118	20.0	102	14.5	82	10.5
35	125	22.0	108	17.0	89	12.0

[1]Source: (*4*).

black cottonwood is shade intolerant and grows in relatively even-aged stands, there may be differences of 10 or more years in the ages of trees on a 0.1-acre plot because the deposition of the fresh alluvial material required for regeneration seldom occurs uniformly. An allowance of one year should be made in obtaining the total age of trees that are bored at a height of 1 foot. Counting of annual rings is facilitated if increment cores are held towards the sun for viewing. The number of plots required to characterize the site quality of a stand will depend on its area and the homogeneity of the data. Height and age are much more reliable indicators of site than are d.b.h. and age, since growth in height is influenced less than d.b.h. by competition.

It is of interest to note that 41 of 287 trees measured grew at rates in excess of those expected for German site I. In the German plantations, from which the above data were derived, 40 trees per acre would be left at age 30. Yet in the same age class at Chilliwack, where these tables were tested, 117 0.1-acre plots supported an average of 43 trees per acre larger than 11.5 inches in d.b.h., and a total of 136 trees per acre not including species other than cottonwood. These data suggest the possibility of producing more timber from plantations than from natural stands which are usually much too dense.

The general appearance of a stand of cottonwood often may be used to form an impression of site quality. Long leaders, smooth bark, and vigorous growth of leaves and branches are indicative of good growing conditions. Poor sites are indicated by short leader-growth and often can be recognized by premature yellowing of leaves in the fall.

Vigor and abundance of lesser vegetation.—Many of the differences in quality of soil, nutrient supply, moisture regime, aeration, and pH are indicated by the kind of lesser vegetation, the amount of any one species, and the vigor of growth of that species. The correlation between growth of lesser vegetation and the possible growth of cottonwood is often high but it must be remembered that any species growing in the shrub or herb layer can indicate only a small part of the many factors that influence cottonwood.

It would take a long and detailed ecological study to describe accurately the plant succession on alluvial soils such as those of the Chilliwack Islands, but the following preliminary observations are possible.

At least three broad site classes can be recognized on the basis of lesser vegetation. The first of these is somewhat better in quality than German site I and can be called the salmonberry (*Rubus spectabilis* Pursh)—stinging nettle (*Urtica* spp.)—fern site. At least one of these three must occur abundantly. The fern may be either swordfern (*Polystichum munitum* [Kaulf.] Presl.) or ladyfern (*Athyrium felix-femina* [L.] Roth). Vigorous growth of the shrubs hazel (*Corylus* spp.) and elderberry (*Sambucus* spp.) also seems to be associated with excellent growth of cottonwood. A medium quality site, corresponding roughly with German site II, may be recognized by the presence of red-osier dogwood (*Cornus stolonifera* Mich.), black twinberry (*Lonicera involucrata* [Richards] Banks), and waxberry (*Symphoricarpos albus* [L.] Blake) as the dominant vegetation of the shrub layer. Thimbleberry (*Rubus parviflorus* Nutt.) and the common wild rose (*Rosa nutkana* Presl.) are also commonly found on this quality of site. The poorest quality of site which corresponds generally with German site III is often indicated by the common horsetail (*Equisetum arvense* L.). Land of this site quality is usually low-lying and is subject to flooding for as much as six weeks in an ordinary year. The common horsetail and the tall horsetail (*Equisetum hymenale* L.) do not always indicate poor sites. Occasionally, the horsetails may be present on layers of clay deposited over fine sand or silt on higher ridges or edges of watercourses which may be of second and rarely first site quality. In a few instances, poor and scrubby growth of the site II indicators has been associated with thin layers of fine textured soil over gravel and cottonwood stands of III, or poorer, site quality.

Many plants other than those indicated above may be used to provide some clues as to growth potential for cottonwood. Conditions are not suited to cultivation of cottonwood where acid and excessively moist ground is indicated by tall reed grass, iris, spirea, or sphagnum mosses. Cottonwood may have difficulty maintaining good growth on lands occupied by some members of the willow family. Where willows have been well-established, it is likely that best results will be secured by planting one-year or older saplings rather than cuttings of cottonwood. Many areas currently supporting a good stand of alder are capable of growing a more valuable crop of cottonwood under intensive management.

Topographic position.—The topographic positions redefined by Beaufait (*2*) for willow oak (*Quercus phellos* L.) in the Mississippi River Delta may be used in mapping with aerial photographs the site quality for black cottonwood. He found that the four topographic positions of "high ridge" or "front," "low ridge," "high flat," and "low flat" were strongly associated with site indices arranged from high to low. High ridges form the highest land on alluvial bottoms and are rarely flooded. Low ridges are a few feet lower, more numerous, and occur on lower banks of high ridges and along sluggish, less permanent watercourses. High flats are those that drain free of water within a few days after the river or stream is again between normal banks. Low flats retain a cover of water that persists well into the growing season, thereby effectively reducing the possibilities of establishment and duration of growth. These four topographic situations are present on a reduced scale in the Lower Fraser River Valley.

Soil Requirements

Black cottonwood requires abundent moisture, nutrients, and oxygen in soil of pH 6 to 7 for optimum growth. These requirements may be met satisfactorily by many combinations of texture, porosity, depth, depth-to-water-table, and nutrient status. No single soil factor could be related consistently to the quality of black cottonwood stands with which it was associated.

This may be explained in part by the fact that most of the soils studied were alluvial, flooded frequently, and very young geologically speaking. They have no development of soil horizons and may be changed in amount and quality of fine material during any flood year. Actually, site quality changes every time the land is flooded. The poorest quality of soil would be that just forming on gravel bars. The best soil is deep fine-textured material that is topographically higher than average but still subject to flooding in extreme high water. Only the soils on high ridges had good incorporation of humus and large numbers of earthworms.

At least 18 inches of loam or heavier soil are required for good growth if the soil is underlain by gravel. Cottonwood grows poorly where water is stagnant; flooding, with fast-moving water that is rich in oxygen and nutrients, speeds growth. Stagnant pools which occur in depressions and in some back-waters of rivers, shorten the effective period of growth. Dr. V. Krajina of the University of British Columbia has suggested that where fine sediments have been deposited on the surface these may inhibit aeration, slow percolation of summer rains, and reduce growth of the cottonwoods. Ridges of sand that have been cut off from the main water channels are likely to suffer from drought in dry summers but sand ridges along main stream channels support many excellent stands of cottonwood.

The best growth of black cottonwood occurs on the series that may be described as Monroe silty clay loam (*4*). This soil series is an extremely broad descriptive unit and the many local variations just described occur within it. Some low-lying cottonwood stands of site quality III are growing on the Langley clay soil series.

The soils on which black cottonwood is growing in the Chilliwack-Agassiz area are high quality agricultural soils and would be farmed were it not for the risk of periodic flooding which could only be reduced at this time by prohibitively expensive dyking systems. Tests have shown that the levels of nitrogen, potassium, and phosporus present on the loam and clay soils are sufficient for most agricultural crops. Even the coarse sand is suitable if flooded periodically. According to Wittich (*3*) poplars require abundant supplies of calcium. Fortunately, most alluvial soils of the lower Fraser River Valley contain an abundant supply of calcium. Growth of cottonwood might be limited by low levels of calcium in some marshy soils and in peat bogs. Cottonwoods grow well in soils that are neutral or slightly alkaline but may grow poorly in some soils with a pH below 5.5. Hybrid poplars used in the Fraser River area are less tolerant of low pH than is black cottonwood.

Some upland soils are well suited to growth of black cottonwood. A few glei type soils duplicate the excellent moisture and nutrient status of alluvial soils. Such glei soils usually occur in depressions and on lower slopes, possess a deep glei layer and a relatively high pH, and have ground water from higher slopes combined with precipitation. If rainfall is abundant, growth can be rapid on fine wind- or river-deposited soils that have suitable supplies of calcium and other nutrients. Heavy upland clay soils are not likely to be satisfactory unless their structure can be improved by incorporation of humus. Loam and loamy sands belonging to the "brown soil" group may be suitable for cottonwood only if they have an abundant supply of nutrients and water.

Possibilities of Soil Improvement

Most lands on which black cottonwood is growing are so richly endowed with nutrients that there is little need for consideration of chemical fertilization at this time. In most cases, too much or too little water seems to be the prime factor limiting growth.

Spot fertilization has been suggested by Aird (*1*) as a method of overcoming competition in the juvenile period and thereby reducing the cultivation necessary for establishment of cuttings. This was tried near Chilliwack in 1956 without success. Both lime and 16-20-0 fertilizer have been used to improve the quality of growth of cottonwood in a nursery near Vancouver situated on heavy clay soil with low pH.

Cultivation of cottonwood will do much to improve and make uniform the site quality of any particular property. The land-clearing operation and incorporation of humus into the soil by disking should improve the tilth of most soils. Disking will be particularly helpful where a surface layer of clay has been deposited.

Conclusions

These preliminary observations should prove useful in planning the management of natural stands of black cottonwood and in determining sites potentially suited to that species. In order to determine the precise nature of the relationships between growth of black cottonwood and the site factors discussed here, more intensive studies are required.

Literature Cited

1. AIRD, PAUL L. 1956. Fertilizers in forestry and their use in hardwood plantation establishment. Pulp & Paper Mag. of Canada, convention issue. P. 376.

2. BEAUFAIT, W. R. 1956. Influence of soil and topography on willow oak sites. Southern Forest Expt. Sta., Occas. Paper No. 148, 11 pp.

3. HESMER, H. 1951. Das Pappelbuch. Verlag des Deutschen Pappelvereins, Bonn. 304 pp.

4. KELLEY, C. C., and R. H. SPILSBURY. 1939. Soil survey of the Lower Fraser River Valley. B. C. Dept. of Agric. in co-operation with Experimental Farms Service, Canada Dept. of Agric. 67 pp.

Injury to Plants from Rapidly Dropping Temperature in Washington and Northern Idaho

R. Daubenmire
Professor of botany,
State College of Washington,
Pullman

IN NEARLY 70 years of recorded weather history, Washington and northern Idaho have on three occasions experienced exceptionally sharp freezes in late autumn or early winter that caused considerable damage to plants. A brief review of these events is warranted since the records are consistent enough to permit the drawing of significant conclusions.

Freeze of December 1924

Aside from the actual records of daily maximal and minimal temperatures for the freeze of December 1924, two publications have referred to its effects on plant life. The monthly weather summary for Washington (*7*) indicated damage to crops over a wide area, stating that there was suspected injury to winter wheat, truck crops, and peach spurs. On the west side of the Cascades in Washington it is possible that even native taxa were damaged, for the summary also states: "Shrubbery in the Puget Sound country is reported as damaged by the cold." Unfortunately the brevity of this comment robs it of most of its fundamental biologic significance, for there is no indication as to whether or not the damage was confined to exotic "shrubbery."

In the period 1911-1917 a series of plantings of different geographic races of *Pinus ponderosa* were made at the Priest River Experimental Forest in Bonner County, Idaho (*12*). Included were populations obtained from the Siskiyou and Shasta National Forests which are situated in the mild oceanic climates of southwestern Oregon and north central California, respectively. The sudden drop in temperature (Fig. 1, upper part) on December 15, 1924, when the

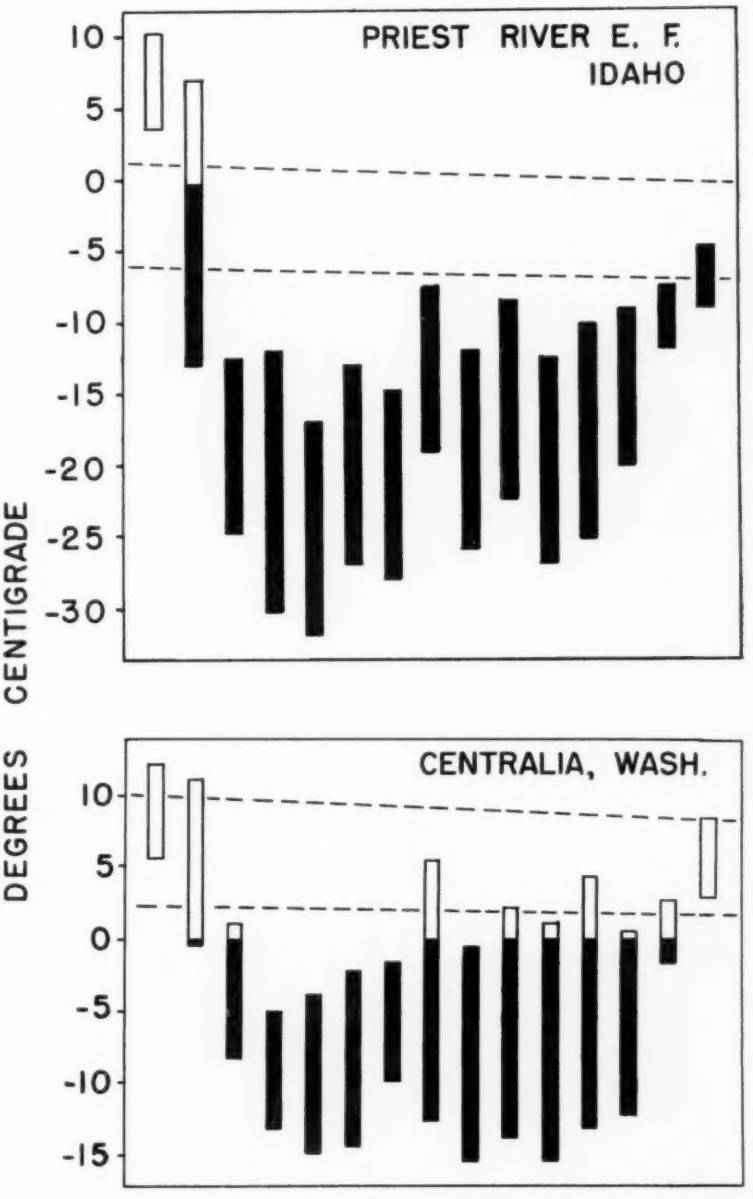


FIG. 1.—Diurnal ranges of temperature during the unseasonal cold weather of December 14-28, 1924. Dashes represent smoothed trend lines based on monthly means, intended to approximate the average ranges of diurnal temperatures at this time of year. Shading of columns indicates temperatures below the freezing point of water.

Siskiyou planting was eight years old and the Shasta nine years old, proved disastrous. Most trees of the Siskiyou planting were killed, and the Shasta planting was completely destroyed. Races from other regions, all with more continental climates but from places as remote from the test location as Arizona and South Dakota, withstood the temperature drop without evident injury. A curious feaure of this cold wave that is also characteristic of most others discussed in this report is that immediately prior to the invasion of cold air there was a brief period of abnormally high temperatures which served to accentuate the extent of the subsequent precipitous drop.

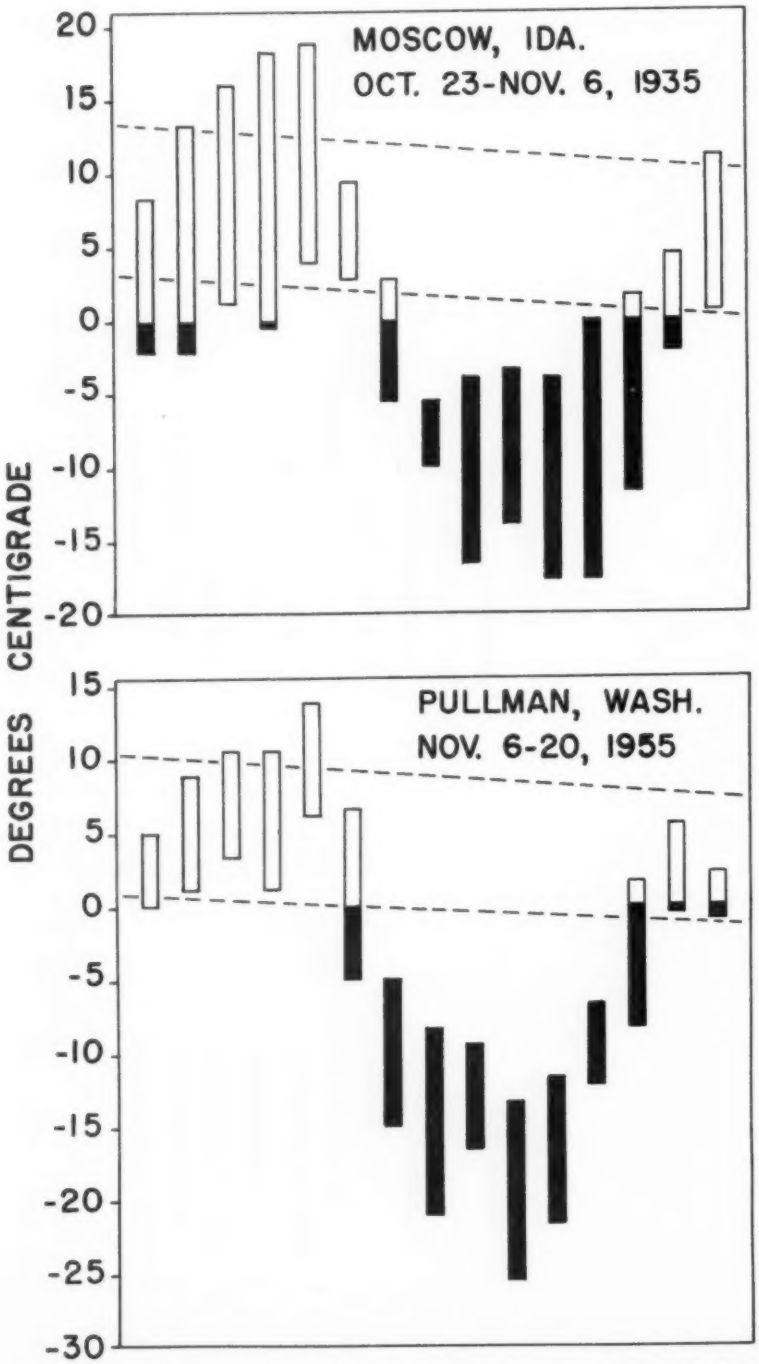


FIG. 2.—Comparison of damaging cold waves for the same area at intervals of 20 years. Moscow and Pullman are located about 10 miles apart on similar topography.

Comparison of the actual temperatures with norms for the season (Fig. 1) does not suggest greater abnormality for the coastal region (as exemplified by Centralia) than for the inland station; yet if native plants sustained damage, it was confined to the coastal region.

Freeze of October-November 1935

In the autumn of 1935, temperatures prior to October 17 had not dropped lower than 30°F. in the Weather Bureau instrument shelter at Moscow, Idaho (Fig. 2, upper part). On the 25th, and especially on the 26th and 27th, daily maximal temperatures rose well in excess of the average, then on the 28th a mass of cold air began to invade the area and temperatures dropped rapidly. For a period of five consecutive days temperatures were so abnormally low that daily maximal remained below the normal minimal values for this season, resulting in a condition of about equal intensity but shorter duration than that which destroyed pines at the Priest River Experimental Forest 11 years earlier (compare Fig. 1, upper half, and Fig. 2, upper half).

Comments published in the then-current issues of *Climatological Data* (*8*) recognized this as "unusually cold weather for so early in the season," resulting in the coldest November temperature since 1893. Elsewhere (*9*) it was stated that "damage from the early November freeze was considerable" also in Washington, especially to "pears in the Kennewick section, sweet cherry, apricot, and English walnut trees." In the memory of the writer, damage to sweet cherries (probably mostly the Lambert variety) proved so extensive in the Pullman-Moscow area that many trees were cut down the following summer.

Freeze of November 1955

Almost exactly 20 years later than the episode described above, the weather phenomenon was repeated. Both the maximal and minimal temperatures were well above normal the day before an influx of polar air brought on rapid freezing. For six consecutive days even the maxima remained below the normal minima at Pullman, Washington.[1] The depression was greater and more enduring than 20 years earlier, but the pattern was strikingly similar, as was the time of year (Fig. 2, lower half). The 1955 cold wave was the more severe, as the depression of maxima below the normal minima was greater, and this phenomenon continued for six consecutive days.

According to the U. S. Weather Bureau (*11*) "new minimum temperature records for November were set in many areas during this freeze; the entire State had the coldest weather of record for so early in the season, and it was the longest period of severe cold ever noted in the 66 years of record."

At the writer's home located about one mile west of Pullman, Washington, 52 species or varieties of woody plants were damaged, in degrees ranging from slight to complete killing. Injured patches of bark appeared to die at varying times spread over a number of months, these sometimes completely girdling and thereby killing the distal portions of axes or branches. Frequently the girdled stems put out new leaves at the usual time the following spring, these crops of leaves dying at varying intervals over the summer.

By no means were all the exotics damaged. Many showed no detrimental effects, e.g., pears (Bartlett, Winter Nellis, Sheldon), sour cherries (Lake Duke), *Picea abies*, *Thuja occidentalis*, *Kolkwitzia amabilis*, and *Spiraca vanhoutei*. Black raspberries (Cumberland), oddly enough, gave exceptional yields the following summer. Strawberries bore normally.

[1]No temperature records had been made in Pullman in 1935; this station is 10 miles from the one at Moscow, Idaho, so that the data are closely comparable.

There appeared to be a correlation between the degree of injury and degree of age of plant and seasonal maturity of leaves. A young apricot tree (budded to Tilton and Royal varieties) was killed while an established tree (Wenatchee Moorpark) suffered negligible damage. Young *Robinia pseudoacacia* that were exceptionally vigorous as a consequence of fertilization of the soil were heavily injured, whereas others that had been forced into seasonal maturity by drouth and low fertility survived. A well-established tree of the early-maturing Redhaven peach escaped damage while the later-maturing Rochester succumbed. Leaves of many ornamental trees that were still green were frozen without an abscise layer forming, so that they hung on the trees through the winter. In fact, a tree of *Quercus (coccinea?)* located at the south edge of Pullman retained its full complement of dead 1955 leaves throughout the summer of 1956, along with the new crop.

Native plants at the site west of Pullman completely escaped injury. This also applies to plants that had been transplanted here on the grassland from their native homes in the relatively cool and moist coniferous forests of the mountains a few miles to the east: *Acer glabrum* var. *douglasii*, *Berberis nervosa*, *Betula papyrifera*, *Larix occidentalis*, *Pachistima myrsinites*, *Pinus ponderosa*, *Pseudotsuga menziesii* (Mirb.) Franco, *Sorbus scopulina*. However, all three of the "natives" that had been transplanted upslope from drier climates (*Artemisia rigida*, *A. tridentata*, and *Chrysothamnus nauseosus* var. *albicaulis*), were included in the group of plants completely killed.

Microclimates in the small town of Pullman were sufficiently different from those of the surrounding countryside that damage to exotics in the town were relatively light.

West of the Cascades, "minimum temperatures . . . prior to this storm . . . had remained above freezing in many of the . . . areas;" then when the cold air moved in "maximum temperatures remained below freezing for approximately four days or longer. This was as many days with a maximum temperature below freezing as is usually recorded during an entire winter." It was immediately reported that "losses of strawberries, raspberries, blackberries, etc., and small fruits appear to be very high. Roses, shrubs, and many ornamental trees appear to have been killed. Nurseries suffered heavy losses of plants. Indications are that some orchards may have been damaged in both divisions of the State." This latter proved to be an underestimate. "There was an unusually heavy drop of needles from evergreen trees" (native? exotic?) "after temperatures began to moderate." A preliminary estimate of freeze damage to crops was that it "may reach 11 million dollars" (*11*). A year later the loss was reappraised at 66 million dollars.

Although the cold wave of November 1955 caused no apparent damage to native plants in eastern Washington and northern Idaho, Taxa native to the seaward side of the Cascades were extensively damaged (*2*). Injury to native evergreen trees there was not uniform. It was lighter on the windward side of the Olympic Peninsula than elsewhere, lighter below an overstory of taller trees, lighter on northerly rather than on southerly slopes, lighter in the centers of timber tracts rather than along their margins, lighter where snow covered seedlings rather than having been blown off. *Tsuga heterophylla* was more severely damaged than was *Thuja plicata*, with *Pseudotsuga menziesii* least damaged of the three. The evergreen *Arbutus menziesii* and the deciduous *Alnus rubra* were extensively killed. The evergreen shrubs *Vaccinium ovatum* and *Gaultheria shallon* were also heavily damaged.

Severe damage or killing of many exotic trees and shrubs as well as a few natives (*Alnus rubra*, *Cornus nuttallii*, and *Tsuga heterophylla*) was also reported at the University of Washington Arbore-

tum, at Seattle (*5*). It was noted that young and actively growing saplings of *Cornus nuttallii* were more susceptible than seedlings or old trees (*13*). Also, injury to the stem "six to eighteen inches above the ground line" was especially fatal (*13*).

It is interesting to compare conditions in northern Idaho and on the west side of the Cascades for this period, since a pair of stations can be selected both of which are surrounded by forests containing much *Tsuga heterophylla, Thuja plicata,* and *Pseudotsuga menziesii.* Only the *Pseudotsuga* has been recognized as taxonomically distinct in the areas, *P. menziesii* var. *menziesii* to the west of the Cascades and *P. m.* var. *glauca* to the east. The length of the period of below-average temperatures (Fig. 3) and the degree of depression appear of about equal magnitudes. Since damage was sustained only by the coastal ecotypes, one might conclude that the ecotypes of the oceanic climate are genetically less adapted to endure deviations from average temperature ranges than are ecotypes of the quasi-continental climate. Stated in another way, the inland ecotypes are better adapted to their climate than are the coastal races. Since Duffield (*2*) remarks on variation in damage sustained by individuals exposed to the same microclimate, it may be postulated that the coastal populations contain genotypes that are fairly tolerant of unusual cold conditions, but have not been rigorously purged of the sensitive genotypes as appears to be the case inland.

The hypothesis as to the distinct difference in cold tolerance between oceanic and quasi-continental ecotypes, suggested by the circumstances described above, is strengthened by two further observations. In a nursery located on the campus of the University of British Columbia at Vancouver, B. C., about a hundred feet above sea level and a few hundred yards from the sea, 2-year-old seedlings of *Pseudotsuga menziesii* representing both oceanic and continental ecotypes had grown for two years under oceanic climate at the time of the 1955 freeze. Subsequent tallies of damage showed a distinct tendency toward greater damage to those plants representing oceanic races (*4*). Also at La Grande, on the seaward side of the Cascades in Washington, only oceanic ecotypes of *Pinus ponderosa* from Washington and Oregon were damaged severely, whereas trees representing continental ecotypes were damaged lightly or not affected (*3*). The latter circumstance is complementary to the racial test of *Pinus ponderosa* which is located in Idaho and provided information described earlier.

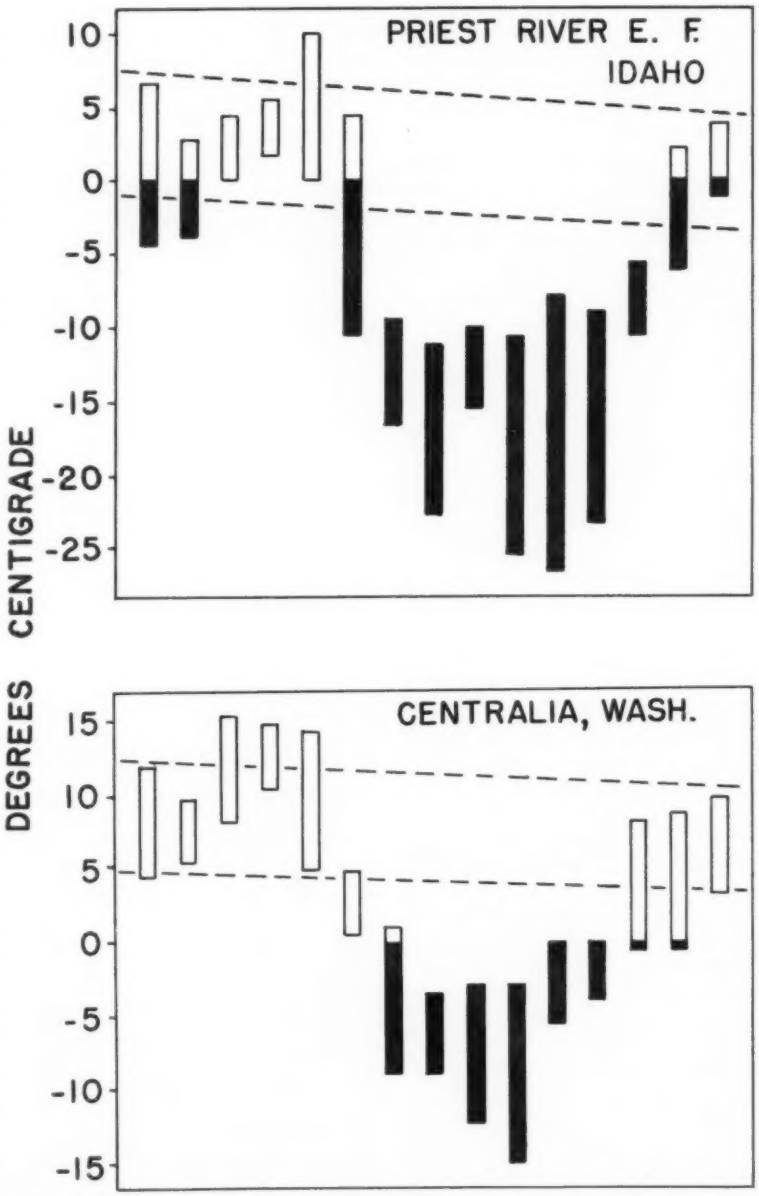


FIG. 3.—Comparison of the character of one cold period, November 6-20, 1955, as recorded 50 miles from the ocean at Centralia, Washington, and 300 miles from the ocean at Pullman, Washington. Both areas are in forests where *Tsuga heterophylla, Thuja plicata,* and *Pseudotsuga menziesii* are comon trees, but these trees were damaged only near the coast.

Discussion

A conclusion that the shoots of oceanic ecotypes are damaged by sudden drops in temperature in late autumn or early winter, whereas ecotypes from quasi-continental climates are little if at all damaged, seems well supported by the observations reported above. It rests upon the divergent responses of unintentional but nevertheless fully satisfactory reciprocal transplants of *Pinus ponderosa* races grown in both climatic types, upon the divergent responses of diverse races of *Pseudotsuga menziesii* grown in oceanic climate, and upon the differences in damage sustained by native vegetation in two regions where the degree of severity of freezing appears equivalent.

One practical application of this conclusion is suggested. There is a growing industry in the vicinity of large metropolitan districts near the coast based upon growing small trees of *Pseudotsuga menziesii* that are harvested in a short rotation and sold for decorations at the Christmas season. Since only symmetrical and healthy trees are salable, and sudden drops in temperature may be expected to cause severe economic damage to the plantations at intervals of perhaps only a few rotations, the risk involved in using coastal ecotypes might be avoided through the use of inland ecotypes instead. The feasability of this practice would, of course, hinge upon finding at least one inland ecotype with growth rate, susceptibility to disease, or other characteristics that did not nullify the advantage of superior cold tolerance.

The freeze phenomena also have a bearing upon ecologic plant geography. An hypothesis has been advanced that the limits of plant ranges may be set by climatic extremes, but this has been recently reviewed in detail and challenged in part by pointing out the complete lack of any factual support for areas regularly subjected to freezing weather in winter (*1*). Severe as they were, the botanical consequences of the three extreme freezes reported above show that for the region and time span concerned, temperature extremes would have to be much more violent to cause enough disruption of life cycles to become a key factor determining plant ranges. Heavy damage or even death of exotics is not valid evidence for the hypothesis, since exotics are planted well beyond their natural ranges. Critical support for the hypothesis must consist of depopulation of at least a sector of at least a thin peripheral belt about a plant's range, and although many native plants are at the margins of their ranges in Washington and northern Idaho, none of these is known to have suffered any damage to their aerial parts that cannot be completely repaired by one or two near-normal seasons.

Summary

Abrupt invasions of abnormally cold air masses in late autumn or early winter have been recorded in Washington and northern Idaho in 1924, 1935, and 1955. Exotic plants were damaged and sometimes completely killed during each of these cold waves. In one garden at Pullman, Washington, all (eight) woody plants transplanted here from wetter climates immediately to the east survived without injury, whereas all (three) woody plants that had been transplanted here from drier climates immediately to the west were killed completely. Native plants in the quasi-continental climate of eastern Washington and northern Idaho appear not to have been damaged, but in the oceanic climate to the west of the Cascades there was extensive damage to natives in 1955 and possibly also in 1935. Since the relative abnormality of the cold waves appears to be the same on both sides of the Cascades, it may be concluded that the coastal ecotypes of shrubs and trees are less well adapted to their climate than are the inland ecotypes. This conclusion is borne out by divergent behavior of inland and coastal races planted together in both climatic regions. It would appear that on account of their hardiness, the use of inland ecotypes might be less risky in coastal plantations producing Christmas trees. Despite the conspicuous damage and great economic loss resulting from these three cold waves, there is no evidence in the 67 years of weather records in this area that low temperature extremes have any influence in determining the ranges of native plants.

Literature Cited

1. DAUBENMIRE, R. 1956. Climate as a determinant of vegetation distribution in eastern Washington and northern Idaho. Ecol. Mono. 26:131-154.
2. DUFFIELD, J. W. 1956. Damage to western Washington forests from November 1955 cold wave. Pacific Northwest Forest & Range Expt. Sta. Res. Note 129.
3. GESSEL, S. P. 1957. Based on unpublished data which were generously furnished through correspondence.
4. HADDOCK, P. G. 1957. Based on unpublished data which were generously furnished through correspondence.
5. MULLIGAN, B. O. 1956. Trees killed by cold weather, November 11-18, 1955, at University of Washington Arboretum, Seattle. Univ. of Wash. Arboretum. Mimeog.
6. U. S. WEATHER BUREAU. 1924. Climatological data. 27 (Idaho Sec., No. 12):52.
7. ———. 1924. Climatological data. 28 (Wash. Sec., No. 12).51.
8. ———. 1935. Climatological data. 38 (Idaho Sec., No. 10):46; 38 (Idaho Sec., No. 11):50.
9. ———. 1935. Climatological data. 39 (Wash. Sec., No. 11):81.
10. ———. 1955. Climatological data. 41 (Wash. Sec., No. 11)
11. ———. 1956. Climatological data. 41 (Wash. Sec., No. 13):206.
12. WEIDMAN, R. H. 1939. Evidences of racial influence in a 25-year old test of ponderosa pine. Jour. Agric. Res. 59: 855-888.
13. WITT, J. A. 1957. Correspondence.

A Program for Detection and Control of Forest Insects and Diseases in Arkansas

Lloyd O. Warren and Truman Phifer
Assistant entomologist, University of Arkansas, and assistant forester, Arkansas Forestry Commission

IN ARKANSAS, as elsewhere, insect and disease activity in forest lands constitutes part of the overall problem of profitable forest production and management. Formerly, where and when insect and/or disease attack would likely occur could not be foreseen. In some instances insect infestations or disease attack developed to epidemic proportions before attracting attention. As a result of the pine sawfly depredations in the late 1940's and the appearance of epidemic bark beetle infestations in nearby states during recent years, the need for a detection and survey system in Arkansas which would provide information on the current status of forest pest activity was quite evident. Also, modern silvicultural methods put into practice in many areas tended to favor intensified forest pest activity; i.e. planting pure and even-age stands of pine, particularly on poor sites, resulted in increased damage by the pine tip moth and Leconte's sawfly on many plantations. Weather, logging practices, burning, uncontrolled disposal of oil field waste, and other unpredictable factors influence insect activity. Attacks by the black turpentine beetle and by other bark beetles (*Ips* spp.) may often follow logging with heavy equipment during which soil impaction, scarring of trunks and roots take place.

Recognizing the need for an organized system of survey and appraisal of forest pest activity, a group of individuals representing state, commercial, and federal interests met in February of 1954 to discuss ways and means of initiating such a system. As a result of this meeting, the Arkansas State Forestry Commission was asked to develop and activate such a program.

Organization

Lacking qualified personnel and adequate finances to establish a formal forest pest survey and appraisal program as an administrative unit, the Forestry Commission was faced with the problem of organizing existing personnel and facilities into a cooperative, coordinated program. There were several phases to the solution of this problem, as follows:

1. Training forestry personnel on recognition of insect and disease injury and identification of causal agents.

2. Development of a system of reporting from field personnel to a central clearing office.

3. Enlisting cooperation of professional personnel to aid in identification of causal agents, appraising a threatening situation, in making control recommendations, and training of forestry personnel in survey and identification.

4. Establishment of an "action committee" to plan and guide control measures in combating epidemic outbreaks of diseases or insects and to take necessary action to obtain state and federal aid in times of epidemic attacks.

5. Application of regulatory and quarantine laws to forest insect and disease pests.

To train foresters and woodsmen in recognizing insect or disease injury and the identity of the agent responsible, a series of annual training sessions was initiated in 1954. During the first year these training lessons were aimed primarily at the technical foresters, commercial, state, and federal, working in the forest lands. Following 1954, the emphasis was shifted to the woodsmen or subprofessional workers whose activities kept them in the forests most of the time and who would be more likely to notice any unusual insect or disease activity in timberlands. In addition to the foresters and woodsmen, personnel of the Soil Conservation Service and State Plant Board also attended the training sessions. Recognizing the need for educational work among the small tree farmers and timber producers, the Arkansas Agricultural Extension Service joined with the Arkansas Forestry Commission in sponsoring the training sessions in 1957. Thus, all classes of timber workers and landowners are now given instruction on potential forest insect or disease problems during these sessions. The coverage is far from complete; but as an example of the progress being made, the attendance at the training sessions has more than doubled from 1954 to 1957. Field trips are made wherever possible to supplement visual aid and written material used during the meetings.

A second major phase in the program was the development of a system of reporting to a central office. The state forester's office was designated as the central office and an assistant forester was given the responsibility for developing a suitable means of obtaining reports from cooperators in the field. After a trial of several methods, the present system of distributing questionnaires toward the end of each month was adopted. These are sent out to a large mailing list, filled in by the recipients, and returned to the central office. A summary of conditions is then compiled and mailed to all interested parties. While the rate of return of the questionnaires is not one-hundred percent, it is considered sufficiently high to provide an

adequate picture of pest activity. This system is supported by the present fire-prevention units established by the Forestry Commission. There are 21 such units, each in charge of a technical forester, who in turn has one or more helpers. The unit forester is responsible for reporting insect or disease activity observed in his area. Besides the reports made by the unit foresters federal and commercial foresters as well as other individuals representing state and private interests, submit reports on a voluntary basis.

Technical guidance in the program is provided by the Arkansas Agricultural Experiment Station, the Agricultural Extension Service, and the Southern Forest Experiment Station. Entomologists from the Experiment Station and Agricultural Extension Service assist in the identification of insect specimens submitted by field observers, in survey and appraisal and aid in organizing and directing the training sessions. Plant pathologists of the Experiment Station and Extension staff give limited aid in identifying organisms causing tree diseases. Personnel of the Southern Forest Experiment Station have been very helpful in the training sessions, developing recommendations for control measures where needed and serving in an advisory capacity for the program.

To implement the work of the survey and appraisal program, an "action committee" of five persons representing the forest industry was appointed by the state forester in 1956. This committee was delegated responsibility to plan measures and procedures to follow in case of an epidemic attack or emergency situation arising on forest lands. It also is to take procedural action to request state and federal assistance when an emergency situation warrants other than local efforts for control and suppression of pest attack.

The authority to apply quarantine and regulatory measures when needed in times of epidemic outbreaks is not a delegated responsibility of the Arkansas Forestry Commission. Neither, from a public relations standpoint, was it desirable that the commission have and exercise police powers, particularly when another agency had such authority under existing legislation. As the result of conferences with the Arkansas State Plant Board, guide lines were prepared which provide for the instigation of regulatory and control measures when needed to suppress epidemic outbreaks or to eradicate an insect or disease pest of recent appearance. These guide lines are as follows:

Guide Lines to Follow in Preparing for Action to Combat Outbreaks of Forest Pests.

I. The Arkansas State Plant Board is empowered by existing legislation to set up quarantine areas and to execute control measures within designated zones of infestations or infections. Action by the State Plant Board is contingent upon the declaration of an emergency and the establishment of a zone of infestation or infection.

II. The following guide lines are to be followed in preparing to combat outbreaks of forest pests:

a. The existing forest pest detection service will submit regular reports on forest pest conditions to the central clearing office.

b. In the event reports indicate a need for further investigations the central office will request a technical man in that local area to examine the affected area before advice is requested from professional (entomologist or pathologist) personnel.

c. If professional advice is deemed necessary a designated experiment station or extension pathologist or entomologist, whichever is applicable, will be requested to make an on-the-ground inspection of the affected area to verify the identification of the causal agent and to suggest possible action for control or the need for more detailed appraisal of the situation.

d. In the event a more detailed appraisal is necessary and federal assistance in financing may be required, a request will be made to the Southern Forest Experiment Station for assistance in appraising the situation. Subsequent to the appraisal, recommendations will be made to the Arkansas Forest Pest Action Committee as to the need for an action program.

e. If, in the opinion of the specialist, federal participation in control likely will not be required, he will so notify the Arkansas Forest Pest Action Committee and recommend such control measures as may be deemed necessary.

f. On review of recommended action made by the entomologists or pathologists, the Arkansas Forest Pest Action Committee will determine whether the outbreak can be controlled by local action or whether it is necessary to ask the State Plant Board to declare an emergency and to establish a zone of infestation or infection.

g. When an emergency has been declared and a zone of infestation or infection established, the State Plant Board will assume the responsibility of notifying the landowner of the recommend control measures to eliminate the infestation or infection.

h. Where necessary the State Plant Board or designated representative will follow formal notification with an on-the-ground inspection to verify the execution of the recommended control measures.

i. In the event a landowner does not comply with a State Plant Board order to suppress the causal agent on his land, the State Plant Board is empowered to carry out such remedial measures as are necessary, the costs thereof to be assessed against the property of the landowner as authorized in Circular 8, Arkansas Laws on Plants and Seeds, March 1952 (Sections 77-106; 77-120; 77-121, Arkansas Stat. 1947).

III. In instances when an outbreak is judged by professional personnel to be of such severity that the landowner may qualify for state and/or federal aid, the State Forestry Commission, in cooperation with the State Plant Board and through the Arkansas Forest Pest Action Committee, will make such needs known to the appropriate state and/or federal agencies.

Conclusion

With the development of a plan of action to follow in case of an epidemic attack, the present program now includes survey and detection, education, reporting, control, and regulation. The operation of the program is based entirely on the assistance of state, federal, private, and commercial personnel interested in forest production. Through inter-agency cooperation, an active system of survey detection and control is supported by professional personnel. As a result, forest pest activity is sufficiently well observed to detectect any sudden shift from normal levels and the danger of epidemic attack is greatly lessened.

Notes

Ring Counts in Second-Growth Baldcypress

Many thrifty, second-growth baldcypress trees (*Taxodium distichum*) [L.] Rich.) appear to lay down several rings each year. These false rings may cause foresters to underestimate the growth potential of a highly prized species by overestimating the age of sample trees.

Increment cores recently taken from three baldcypress plantations provided a basis for comparing the observed with the expected number of growth rings. The oldest plantation was established in October 1935 by the Tennessee Valley Authority in the Wilson Reservoir near Florence, Alabama. The second plantation, made in March 1937, was in the TVA Pickwick Reservoir near Iuka, Mississippi. The third was installed in March 1939, by the Soil Conservation Service, near Athens, Georgia. One-year-old nursery stock was used at Athens and Iuka, and 2- to 3½-foot wildings at Florence.

An increment core was taken from each of 63 randomly selected trees in these plantations during the 1956 growing season. The samples encompassed most of the soil moisture conditions usually associated with baldcypress. The Georgia plantation is on a well-drained branch bottom. The TVA plantations cover the range from dry, rarely inundated sites to places where water nearly always stands.

All borings were made above pronounced butt swell. Trees subject to the deepest flooding were bored as high as 2 feet above the root collar. All 63 trees had probably reached the height of boring during their first growing season. Yet even when obviously doubtful rings were omitted, the unaided eye counted an average of 28 rings for 17-year-old trees, 30 for 19-year-old trees, and 32 for 20-year-old trees. Within each age group, the larger trees had more apparent rings.

The discrepancies arose because of the tendency to regard each dark, resinous band on the core as an annual ring. These bands are associated with intra-seasonal disturbances in growth — perhaps caused by soil-moisture fluctuations—and in many trees they occur more than once a year. In some cores they are so prominent that true rings are overlooked.

For an accurate count, an increment core must first be sliced down its long axis. This is best achieved by placing the core in a Reineke holder[1] or gluing it to a block of wood, and then sectioning it cross-grain with a razor blade. Although wetting the cores facilitates sectioning and inspection, soaking for over 30 minutes may discolor them.

When the sectioned core is examined under a magnification of 20 diameters or more, the true summerwood appears clearly as narrow bands of small, thick-walled cells. In effect, the false rings disappear, because the stains that cause them are indistinct at this magnification, and the cells in the stained portions are only slightly irregular. Even under low magnification, many of the false rings disappear from the sectioned core. Figure 1 illustrates round and sectioned portions of a core.

W. R. Beaufait[2] and T. C. Nelson[3]

Forest Service, U. S. Department of Agriculture

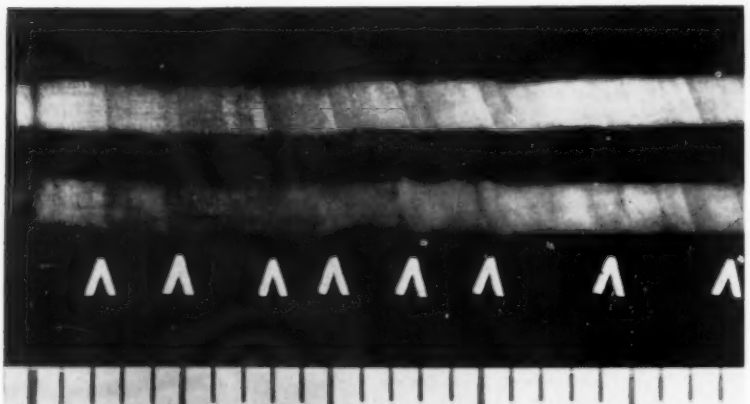


Fig. 1.—Increment core from second-growth baldcypress. *Above*, the true annual rings as seen on a flat, sectioned surface. *Below*, the round surface of the same core. Arrow points designate true rings.

[1]Reineke, L. H. A new increment core instrument and coring wrinkles. Jour. Forestry 39: 304-309, illus. 1941.

[2]Delta Research Center, maintained at Stoneville, Mississippi, by the Southern Forest Experiment Station in cooperation with the Mississippi Agricultural Experiment Station and the Southern Hardwood Forest Research Group.

[3]Athens-Macon Research Center, maintained at Athens, Georgia, by the Southeastern Forest Experiment Station in cooperation with the School of Forestry of the University of Georgia.

A Method for Vegetatively Propagating Yellow-Poplar

Yellow-poplar (*Liriodendron tulipifera* L.) is notoriously difficult to propagate vegetatively. Huckenpahler[1] attempted to root cuttings of yellow-poplar with the aid of a number of auxins and had no appreciable success. The author[2] had less than 3 percent success rooting young yellow-poplar cuttings and was unable to root air-layered yellow-poplar by standard techniques.

A method recently tried, however, shows promise for successfully propagating clonal lines of young yellow-poplar stems. The method consists of longitudinally splitting the entire seedling,[3] coating the exposed root and stem tissue with lanolin, and transplanting the half-seedling. After it had been transplanted, the upper one-half of the stem was clipped off so that stem growth from buds closer to the root collar would become dominant. Shoots from low buds probably have the least risk of breaking off or other injury. A single-edge razor blade was used to split the seedling. The cut was made so that each half retained at least one well-developed, undamaged lateral bud. Seedlings photographed shortly after treatment are shown in Figure 1, and 60 days after treatment in Figure 2.

The six seedlings longitudinally split in early December were placed in a greenhouse under a 16-hour photoperiod. By the end of December, the 12 split-seedlings had completely calloused over, new leaders had assumed dominance, and excellent roots had developed. Some of the seedlings grew as much as 8 inches during the first 60 days. Another 14 seedlings were treated in the same manner in mid-January. One hundred percent broke dormancy and were actively growing by early February.

It is recognized that this method of vegetative propagation has limitations. It can be used only for stock that is small enough to transplant. Such use might be valuable, however, to increase clonal lines from superior seedlings and one-parent progeny material. It may also provide means to increase grafted stock of special value.

THOMAS C. NELSON
Southeastern Forest Experiment Station, Forest Service, U. S. Department of Agriculture, in cooperation with School of Forestry, University of Georgia

[1]B. J. Huckenpahler. Auxins fail to stimulate rooting of yellow-poplar cuttings. Bot. Gaz. 117(1): 73-75. 1955.

[2]T. C. Nelson. Rooting and air-layering some southern hardwoods. 4th South. Forest Tree Imp. Conf. Proc. 1957.

[3]Ramaer, H. Twee Heveaplanten uit een Zaad. De Bergcultures 3: 1267-1269. 1929.

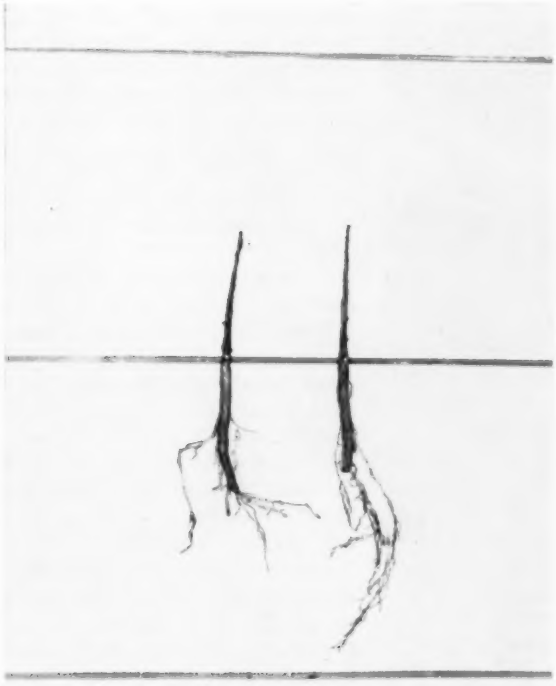


FIG. 1.—Half-seedlings shortly after being split.

FIG. 2.—Calloused side of half-seedlings 60 days after they were split.

Anti-Freezing Hoods for V-Notch Weirs

Streamflow measurements by weirs may become inaccurate if water freezes on the weir or freezes just below the weir so as to pile up and interfere with the flow. To retard or eliminate such freezing, aluminum foil-lined plywood hoods have been designed and constructed for 90° V-notch weirs. Five such hoods were installed in December 1956 on weirs at the Teakettle Experimental Watersheds at elevations of about 6,700 feet in the Sierra National Forest, California (Fig. 1).

The hood's purpose is to trap and return the heat radiated upward from the water as it approaches and crosses the weir. To be effective, the hood must be relatively close to the bottom of the weir's V-notch. Yet it must be designed and installed in such a way as to be self-removing before the water can rise to the level at which the hood could interfere with the flow. A self-removing hood was designed.

The hood (Fig. 2) rests with its two stainless steel strips, "A," on the edge of the V-notch, and is supported on two 6-inch long, 5/16 inch diameter, brass rods (not shown) which extend downstream from the weir plate and fit loosely through the holes in the support legs at "C." The stop "B" prevents the hood from sliding upstream. The bottom of the hood is 12 inches above the V-notch.

Tests at the Hydraulic Laboratory of the University of California, Berkeley, showed that when the streamflow through the V-notch rose to a depth of 10 inches, the force of the water on the splashboard pushed the weir hood off the weir. Thus, the hood was removed from the V-notch before it interfered with the streamflow through the weir.

To rescue the hood when it is removed by a high flow, a length of strong wire is attached to the hood and to a support at the side of the weir. The hood is swung out of the main stream channel by the force of the water.

Preliminary tests during freezing weather early in 1957 indicated that the hoods were effective in preventing ice formation at the V-notch weirs. Although ice on the reservoirs was 4½ to 8 inches deep this winter, the weirs remained free (when streamflow ranged from 0.01 to 0.45 c.f.s.). A quantitative test of the effectiveness of the hood was made on the night of January 17-18, 1957, when the minimum temperature dropped to 18°F. At a weir with no hood, freezing that night caused a decrease of 38 percent in the unfrozen area above the weir. At a weir to which a hood had been added for the night, the unfrozen water area actually increased 6 percent. Thus, the weir hood had an effectiveness of 44 percent in maintaining ice-free water.

During early winter when flows increased, the splash board was effective. The high water pushed the hoods to one side and the flow was unobstructed. The hoods were replaced after the high water subsided.

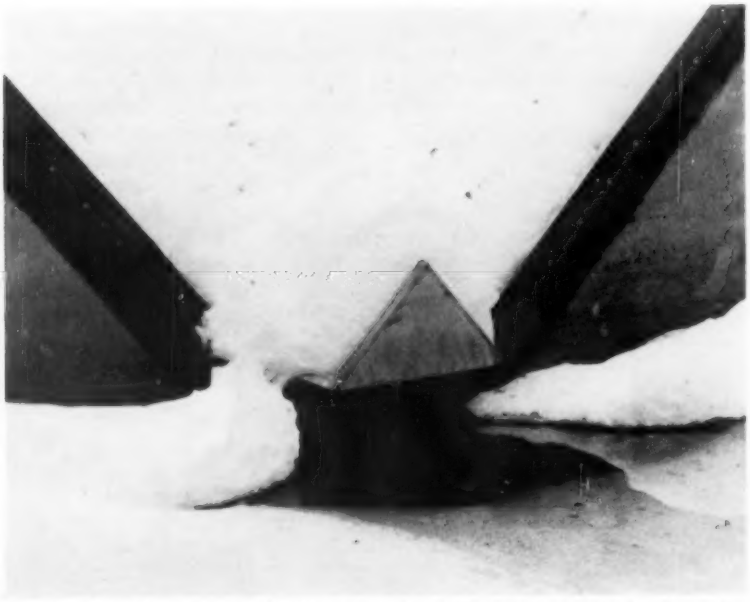


FIG. 1.—V-notch weir covered by anti-freezing hood. Note lack of ice formation beneath hood.

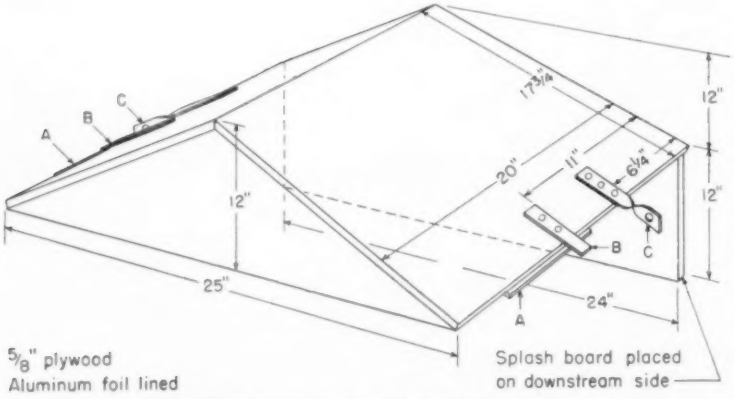


FIG. 2.—Hood for 90° V-notch weir.

C. L. JOHANNESSEN
California Forest and Range Experiment Station, Forest Service, U. S. Department of Agriculture

Points of View

Discussion Invited

Nothing is more frustrating to the author of what he considers a worthwhile and provocative article than to have it received in stony silence. So I am pleased at the length and thoroughness of Bill Bromley's comments on "Government Social Programs and Forestry."[1] I wrote this because I felt many professional foresters knew little about these programs and their relation to forestry. Any forester who has read both the article and Mr. Bromley's comments should no longer be vulnerable on that score.

One way of stimulating people to think is by asking questions. It seemed to me that some aspects of these government social programs justify thinking by foresters. So I asked questions. In his comments, Mr. Bromley has given his answers to some of these questions. Naturally, he cannot be strictly objective in any discussion affecting the pulpwood industry. So it would help round out the picture if we could have the views on these same questions of someone from the other side of the fence.

It is difficult to discuss any economic or social subject with complete impartiality and still find anything worth saying. No doubt, as Mr. Bromley says, I did imply answers to some of the questions I raised. (But before any implications are read into Mr. Bromley's comments let us note that, like him, I too am "in private employ" and at the moment considered by certain interests to have a distasteful bias in favor of the pulpwood industry.) The questions still appear valid to me and my only suggestion to our readers is to get out their March issues and reread the original article.

ALBERT C. WORRELL
Yale University

[1]Bromley, W. S. Comments on "Government Social Programs and Forestry." Jour. Forestry 55:533-534. 1957.

Further Comments on the Relationship of Forestry and Land Surveying

Being both a graduate forester and a registered professional land surveyor, I would like to comment on the proposed registration of professional foresters. I am entirely in favor of the registration of all foresters who do any work that in any way affects the pocketbook of the public, either present or future. But I do feel that a forester should be limited in his field of activity, especially as pertains to surveying.

I see no real reason for amending any of the state laws on licensing or registration of land surveyors. The only change that may be needed would be in the definition of professional land surveyor and/or forester. A forester's activities actually encroach more on the real estate agent's field than on the surveyor's field.

Of course, the forester must know the boundary of the land in his charge to limit the cultural activities necessary for the growing and harvesting of a timber crop. And as mentioned, he must be able to determine if the number of acres he is dealing for in a purchase are actually available as described.

A forester must be taught surveying, if for no other reason than to give him some "land sense." We aren't all fortunate enough to have been reared on a backwoods farm. He needs to know where to look for corners and boundary lines, as he works across the property that is in his charge. He must be able to re-cover lines where they become partially obliterated by logging, fire, or storms. He must know enough about surveying to re-set a corner, should it be drug out by skidding a log over it. He should also be able to determine whether or not a survey is erroneous, and approximately how much.

All the surveying a forester is likely to be called upon to do will either be a retracement of an older survey or a sub-division of such a survey. As long as the forester confines his surveying to the freshening or retracing of old surveys, he will never encroach upon the surveyor's work.

However, should the freshening or retracing of a line bring on a controversy or threat of controversy between land owners, then the problem is strictly in the realm of the land surveyor. If the sickness is too serious for first aid, call a doctor.

Foresters know wood identification and soils and can identify the kind of tree that stood on a certain spot. The length of time this can be determined depends on the species and whether or not the stump burned. The soil will show the location of a tree, and often the location of a post set for a corner. Foresters also have a good knowledge of how long it has been since a creek or road has been changed.

A surveyor is better trained in technique and usually understands all types of error better. He has a better sense of the legal and conformable aspects of a survey. Most engineering schools give a better background of law than do forestry schools, both as to procedure and as to the precedence of monumentation and other evidence.

Most surveyors are better trained in how to handle various surveying instruments, their capabilities and the means available for checking the results of their work. This means that a surveyor will be able to better describe points on the ground, or inversely, to better locate on the ground points described in a deed.

If all surveyors could find and identify evidence and monuments as well as foresters can, their training would be considerably better than it now is.

My suggestion is that the foresters confine their work to re-setting corner posts and retracing marked land lines, and of course, measuring the length of all retraced lines and determining the bearing thereof. But if a line cannot be retraced, or if a controversy arises, then call in a registered professional land surveyor and help him find all the available evidence.

LOUIS N. A. SEEMANN
Chief surveyor, Olin Mathieson Chemical Corporation

A Proposed Program for Forestry Education

The article by John Zivnuska on forestry education in Northern Europe in the February issue of the JOURNAL OF FORESTRY interested me greatly.[1] An application to forestry education programs in the United States of some of the aspects of the northern European education programs could provide the answer to two serious problems of forestry in this country. The two problems are the shortage of trained foresters and the inadequacy of the liberal arts education which the professional forestry student now receives.

My proposal is that there be two separate kinds of forestry schools, comparable but not equivalent to the lower and higher forestry schools of Norway and Sweden. I would suggest that the lower school curriculum be of two years' duration, including a summer session in the field. This length of time would be sufficient to train an individual to handle most nonadministrative duties in the field of forest management. It has the added advantage of conforming to the growing trend in this country towards vocational training at junior colleges.

The higher forestry college would have a five-year program, enabling the students to acquire a better background in the social sciences and humanities than is now available to them in most of the forestry schools in the United States. The practical forestry courses should parallel those of the junior colleges closely enough so that an outstanding graduate of a junior college might obtain admission to a higher college with little loss of credit. The five-year college would be able to grant only a bachelor's degree, but its coverage should be thorough enough so that a moderately long thesis would be the only additional requirement for a master's degree. This might seem to be cheapening the master's degree, but actually is only recognizing that a five-year program of this sort substantially exceeds the normal requirements for a bachelor's degree.

The graduates of the higher forestry colleges would be trained for forestry research, instruction in forestry, or eventual promotion to an administrative level in forest management. The beginning positions in the field of forest management held by graduates of the higher college would be similar to those held by the junior college graduates. The higher college graduates, however, would be able to do work of a more technical nature and to assume responsibilities much sooner than the junior college graduates.

Dr. Zivnuska stated, "(Forestry) students include men whose interest is primarily vocational as well as men looking forward to careers at a professional level. The result is inevitably confusion as to the role of the forester for students, faculty, and public alike." This proposed program would clarify this confusion and channel each type of student into an educational program designed to fit his need. This clarification of functions should attract more students into the forestry schools. In addition, some who now fail to make the grade in existing forestry colleges would find a vocational junior college more suited to their interests and ability. By separating the vocational foresters from the professional foresters, we can accelerate the pace of learning in the higher colleges. Thus, we would not only increase the number of men trained to work in the field of forestry, but we would also be able to graduate a professional forester better qualified to assume responsibility and handle administrative duties.

PHILIP C. HAMILTON
Bureau of Land Management, Eugene, Oregon

[1] Zivnuska, John A. Forestry education in northern Europe. Jour. Forestry 55: 105-114. 1957.

Reviews

Soil Conservation

By J. H. Stallings. 575 pp. Illus. Prentice-Hall, Inc., Edgewood Cliffs, N. J. 1957. $8.50.

Forestry has been characterized as much by art and skill as by the application of scientific knowledge. Keen observation, careful measurements, and intuitive decision have often made up for inadequate information on those basic site factors whose consideration is so essential to the lasting success of forest management. Moreover, in the earlier stages of American forestry, lack of knowledge of soil or site apparently was not too great a handicap. Large areas of old-growth timber had to be converted to young, fast-growing stands, and second-growth stands seemed to need little else besides protection and thinning. If soil washing, stepped-up stream or reservoir siltation, and flash-flooding followed the customary logging methods in most hill and mountain localities, no particular precautions seemed called for. If plantations failed, the land could always be replanted.

Today, however, the intensified pressures of multiple demands for wood, water, recreation, wildlife, livestock feed, etc., and the well-recognized impacts of cutting, logging, grazing, and road building upon water supplies and other off-site resources have spurred foresters and other land managers to learn more about the role of soil. Today foresters are looking into this fundamental component of site ever more exhaustively in their quest for more positive and surer aids in determining the potential health, vigor, and sustained productivity of existing or projected timber stands, as well as the hydrologic characteristics of forest areas and their responses to exploitation and cultural treatments.

Soil Conservation helps fill a real need for the practicing forest manager in these respects. The author divides his subject into four main parts. The first and briefest summarizes the historical aspects of erosion and other soil problems in ancient and modern times. The second describes basic properties and processes of the soil and the means for determining them and evaluating their significance. The third and fourth parts cover in considerable detail the various ways of rebuilding, improving, and maintaining the soil through special practices and through day-to-day land and crop management. He places much stress on soil aggregation and how it may be destroyed or improved, depending on the measures applied.

The chapter on "Woodland Farming" illustrates the concise matter-of-fact approach applied throughout the book. Here the author brings together the evidence on soil-site quality relations and the dependence of site index on soil properties, as developed largely by soil-conscious forest researchers. Many interesting and practical relationships are described, as for example, the discussion on soil moisture and nutrients, wherein is brought out the importance of "fitting the tree to the site," of selecting species for planting and of determining which species to favor in management according to texture and other pertinent soil factors.

This book is not aimed at foresters alone, nor will it meet the needs of the forest-soil specialist. But it does contain a wealth of easily understood information on soil protection, improvement, drainage, and other closely related matters with which forest managers, operators, timber sale personnel, and researchers in silviculture and forest utilization can familiarize themselves to good advantage. Its clear and concise explanations of the elements and activities that integrate to make the soil what it is, and the well-balanced discussion of how particular soil properties and conditions affect land planning, program development, and crop management—including timber—warrant giving it a handy spot in the modern forester's literary workshop.

BERNARD FRANK
U. S. Forest Service

Marketing Forest Products in Pennsylvania

Carroll, Trotter, and Norton. Pennsylvania State University. Progress Report No. 121. 8 pp. Free. University Park, Pa. January 1955.

Marketing Forest Products from Small Woodland Areas in the Northeast—I

N.E. Regional Technical Committee. Bulletin No. 25 (also of Vermont Agricultural Experiment Station, Bulletin 595). 83 pp. Free. Burlington, Vt. June 1956.

Marketing Pulpwood in Michigan

Lee M. James. Michigan State University. Special Bulletin 411. 68 pp. Free. East Lansing, Mich. February 1957.

Unlike agricultural economics research, there has been almost total lack of investigation into the economics of forest products marketing processes until these three publications appeared to fill a void indicated by the 1954 Department of Agriculture Yearbook, "Marketing," which failed to include any statement on forestry or forest products. The single minded attention forest economists have

traditionally given to land management, forest production, and inventory problems may be part of the reason for this prior deficiency. All three publications, which were done at land grant colleges, are now proof of a significant change in forest economics research.

The first study reports on nearly 300 transactions by Pennsylvania woodland owners and reveals some aspects of private timber sales which have long been assumed to exist but never actually investigated on so broad a scale.

A somewhat comparable study covering forest products marketing practices in the New England and Middle Atlantic states represents the combined efforts of agricultural experiment stations working together with the Northeastern Forest Experiment Station; and brings together the best techniques of agricultural marketing specialists, with technical knowledge of forest investigators

Since the significant findings of both studies are essentially comparable their results are presented together:

1. Two-thirds of small owners' sales were made without pre-sale knowledge of the volume or quality of timber.

2. Two-thirds of the sales were made by owners who had no pre-sale knowledge of markets or prices.

3. Half the sales were made by owners who had no knowledge of public or private assistance in forestry. Only 7.2 percent of the owners consciously practiced forestry.

4. In two-thirds of the sales, the owners had only the buyers' scale of volume.

5. Sales under written contract in Pennsylvania brought $9.00 more per M.b.f. than verbal agreements—which prevailed in 75 percent of the cases. The buyers' scale was used alone in 70 percent of the cases.

6. One-third of the sales were stumpage, one-fourth were rough products at the roadside, and the remainder were logs hauled to buyer's mill or railroad landing. Very little outside public or private assistance was given in marketing.

One cannot imagine these same owners selling eggs, milk, or anything else with so little knowledge of how much they had to sell, of going market prices, or accepting the buyer's count of the volume sold.

James makes a distinct contribution in his study of Michigan pulpwood marketing, both through description and analysis of the marketing process and cost-price relationships in pulpwood production.

Each stage of the production and marketing process is described and related to cost data. A few random highlights:

1. Trucking up to 60 miles is generally more economical than rail haul; mills pay $1.50 above rail landing prices for trucked wood.

2. Relative price uniformity exists between buyers with prices moving up or down together as competition for wood increases or decreases.

3. Producers of aspen pulpwood (excepting those owning their own stumpage or doing their own logging) are actually losing money under present cost-price relationships. Pulpwood prices in the region have risen more slowly than other commodities since World War II.

Future studies could include information on the wide variation in scaling practice by paper mills, methods of financing pulpwood production, and the relationship between paper prices and the raw material prices.

All three of the bulletins are well designed research efforts, can be extremely helpful guides in re-examining present forest owner assistance programs, in formulating future plans in this problem area, and can serve as teaching materials on marketing. Other research workers engaged in marketing studies which until now have been directed mainly toward utilization and consumption, will find profitable opportunities in the central problems of cost-price relationships, marketing methods, and marketing information.

CHARLES H. STODDARD
Resources for the Future, Inc.
Washington, D. C.

Wood-Using Industries of New York

By Russell C. Deckert and Raymond J. Hoyle. 124 pp. Illus. State University College of Forestry at Syracuse University, Syracuse, N. Y. 1956. $1.50.

This report covers the results of the most recent of a series of surveys of the wood-using industries of the State of New York. Five such surveys have been made in all, the first in 1912, with subsequent surveys in 1919, 1926, 1948, and this most recent survey, covering use of wood in the state during calendar year 1954. All secondary wood-using industries in the state were enumerated numbering some 2,000 in all, 87 percent of them by personal contact. The results of the survey are reported under some 53 different industrial classifications, ranging from agricultural implements and artificial limbs to venetian blinds and woodenware and novelties.

The recurrent surveys have shown a steadily declining trend in use of wood manufacture in New York State since 1912, from 1,700 million board feet in that year to 655 million in 1946. In 1954 the volume used increased slightly, to 657 million. The authors attribute this declining use of wood primarily to its increasing price in comparison to the price of competing materials, such as metals and plastics rather than to any superior qualities of these latter materials. They point out, however, that the manufacturers of wood products generally have been slow in improving the efficiency of their operations. During the past eight years some progress is noted among these manufacturers in installation of new machinery that results in greater productivity, and work to closer tolerances. "In many cases" they say, "the manufacturer has come to appreciate the value of attractive and durable wood finish and the progress in this field has resulted not only in a better product, but also in an increase in sales appeal. New and improved wood adhesives and gluing techniques have also added to the improvement of the product produced."

"However," they note, "in spite of the improvements made by the wood industry in the utilization of raw materials and manufacturing techniques there are still many fields wherein the industry is in need of improvement, and in some cases has made little progress."

The proportion of the total volume of wood used in manufacture in the state produced from local forest stands was the highest in 1954 (26.5 percent) that it has been since 1912 (31.2 percent). In 1919 and 1926 only 14.8 percent of the wood used was locally produced. This is in part due to improving conditions of local stands, resulting from fire control and forest management practices; and in part to improving technology in the industry, which enables it to use more of the species available locally. Another factor, as the authors point out, is undoubtedly the increasing willingness of owners of large forest estates in the Adirondacks to open their lands to timber harvesting activities. Primarily, of course, price is the governing factor.

The detailed data in this report are well worth studying for the trends they reveal in the use of different species, and in the use of wood in different industries and products. Use of southern pine, for example, has been steadily declining over the years, both in volume and in proportion, while use of Douglas-fir has been increasing. Twenty-six of the industries reported on show increases in their use of wood since 1946. Notable among these are prefabricated housing and general millwork. Kitchen cabinets also consumed an increased amount of wood. The amount of wood used in fixtures and flooring also increased, but the amount used for furniture decreased slightly between these two years. All of these industries were associated with the housing boom in the state in 1954. One of the most notable increases was registered in the amount of wood used in the manufacture of pallets. Use of wood in sporting goods also increased. But wood used in trunks and suitcases, television, radio, and high fidelity cabinets, sewing machines, refrigerators, motor vehicles, laundry equipment, crating, and baskets and boxes decreased materially.

All in all Messrs. Deckert and Hoyle have supplied the forestry profession, and all others interested in the use of wood, a tremendously valuable document in this report of the most recent of a long-continued series of comparable surveys. It is well worth intensive study by all those interested in successful forest management, as well as by those interested in forest utilization. Of particular importance to both of these groups are the recurrent examples of the necessity of keeping the cost of wood used in manufacture down, in order that it may continue to compete with other materials in our increasingly competitive industrial economy.

Fred C. Simmons
Northeastern Forest Experiment Station

❦❦❦

The First One Hundred and Fifty Years: A History of John Wiley and Sons, Incorporated

242 pp. Illus. John Wiley & Sons, New York. 1957. $7.50.

In marking its 150th anniversary in the publishing business, John Wiley and Sons Company has chosen to relate its history through a summary of its publications in *The First Hundred and Fifty Years*, a brief history of the company and a collection of 25 chapters listing its contributions to the scientific literature in America today.

Men in varying fields of science have contributed chapters reviewing the literature in their own fields of specialization to this history of publishing.

In a chapter entitled "Trees" Ralph S. Hawley discusses some of the 52 books on forestry published between 1903 and 1954. The first of these was Samuel B. Green's *Principles of American Forestry*. Other authors included in the list are Franklin F. Moon, Nelson C. Brown, John A. Ferguson, Henry S. Graves, H. H. Chapman, Hugo Winkenwerder, Elias T. Clark, Harold C. Belyea, Isaiah Bowman, G. Frederick Schwarz, James W. Toumey, Hawley, Austin F. Hawes, R. H. Westveld, Samuel J. Record, George A. Garratt, Frederick F. Wangaard, Ralph C. Bryant, J. P. Kinney, Jay L. B. Taylor, William Solotaroff, Ernest E. Hubert, Dow V. Baxter, Arthur W. Sampson, Harold J. Lutz, Robert F. Chandler, A. B. Recknagel, Theodore S. Woolsey, and Leonard W. Wing.

One of today's largest publishing companies, Wiley's had its beginning as a little printing shop opened by Charles Wiley, bookseller, publisher, and printer, in 1807 in New York. By 1815 he had moved into a larger shop which became a gathering place for the American literary figures of the day.

Wiley depended almost entirely on imports from Europe for his early material. But his interest in and association with American authors naturally led him to publish their works. Probably the best known among the early contributors to the Wiley titles was James Fenimore Cooper.

Charles Wiley died in 1826 and his son John took over the business. After many changes in partnership, the firm became John Wiley & Sons in 1875.

By the beginning of the twentieth century more and more material was being written about the biological sciences and was being published by Wiley and Sons. In the years 1926-1953 Wiley published 65 new scientific titles, twice as many as had been published by the company in the preceding 125 years.

Jane Cook
SAF Staff

Current Literature

Compiled by MARTHA MEELIG, *Librarian, State University College of Forestry at Syracuse University*

Range Management Section Compiled by Division of Bibliography, Library, U. S. Department of Agriculture

General

It's a Big Country. By B. L. Burman. Doubleday, Garden City, N. Y. 1957. $4.

John Muir, Father of Our National Parks. By Charles Norman. 191 pp. Julian Messner, Inc., New York. 1957. $2.95.

An Outline of Norwegian Forestry. By Knut Skinnemoen. 103 pp. Illus. The Norwegian Forestry Society, Oslo. 1957. About $1.50.

Tamarac. (A novel). By Margaret Hutchison. 356 pp. St. Martin's Pr., New York 17. Sept. 1957. $3.95.

Wings of the Forest. By W. J. Long. Doubleday, Garden City, N. Y. 1957. $4.

Conservation

Forests and the Natural Water Cycle; A Conservation Teaching Aid. 4 pp. Illus. U. S. Forest Serv., Washington 25, D. C. 1957.

Farm Forestry

Christmas Trees for Pleasure and Profit. By A. G. Chapman and R. D. Wray. 215 pp. Illus. Rutgers Univ. Pr., New Brunswick, N. J. 1957. $3.75.

Economics of the Farm Woodland in the Eastern Pennroyal Area of Kentucky. By W. B. Back and others. Kentucky Agric. Expt. Sta., Lexington. 1956. Bul. No. 650.

How to Farm Your Forest; A Guide for Woodland Owners in Southern Illinois. By L. S. Minckler and J. F. Hosner. 68 pp. Illus. Southern Illinois Univ. in coop. with Central States Forest Expt. Sta., Carbondale. Dec. 1956. Misc. Release No. 11.

Forest Management

Preliminary Aerial Volume Tables for Conifer Stands in the Rocky Mountains. By K. E. Moessner. 17 pp. Illus. Intermountain Forest & Range Expt. Sta., Ogden, Utah. 1957. Research Paper No. 41. Mimeog.

A Procedure for Converting Conventional Tree Volume Tables (Cubic) to Formulae (Part 1). By P. D. Kemp. 5 pp. Intermountain Forest and Range Expt. Sta., Ogden, Utah. 1957. Research Paper No. 43. Mimeog.

Regression Coefficients for Computing Cubic-Foot Volume of Rocky Mountain Trees. By P. D. Kemp. 12 pp. Tables. Intermountain Forest & Range Expt. Sta., Ogden, Utah. 1957. Research Paper No. 40. Mimeog.

Forest Resources

Forest Resources of Taiwan. By G. E. Doverspike, Paul Zehngraff, and Hsing-chi Yuan. 56 pp. Illus. Chinese-American Joint Commission on Rural Reconstruction, Taipei, Taiwan, China. Dec. 1956. Forestry Ser. No. 3.

My Timber Is Gone . . . What Shall I Do Now? 20 pp. Illus. Univ. of Calif. Agric. Ext. Serv., Humboldt County. 1956.

Timber Resources. By J. A. Hall. 13 pp. Charts. U. S. Forest Products Lab., Madison, Wis. 1957. Rept. No. 2080. Mimeog.

Protection

Benzene Hexachloride Sprays to Protect Sawlogs from Insects. By W. B. Becker. 2 pp. Univ. of Massachusetts Dept. of Ent., Amherst. 1957. Mimeog.

Forest Insect & Disease Conditions in the Northeast—1956. By W. E. Waters and A. M. Waterman. 23 pp. Illus. Northeastern Forest Expt. Sta., Upper Darby, Pa. 1957. Sta. Paper No. 94. Mimeog.

Forest Insect Conditions in the Southeast During 1956. By W. F. McCambridge and R. J. Kowal. 7 pp. Southeastern Forest Expt. Sta., Asheville, N. C. 1957. Sta. Paper No. 76. Mimeog.

Forest Pest Conditions in California—1956. 20 pp. Illus. California Forest Pest Control Action Council, Sacramento. 1957. Mimeog.

Notes on the Balsam Woolly Aphid. By J. A. Rudinsky. 12 pp. Illus. Weyerhaeuser Timber Co., Tacoma, Wash. 1957.

Pine Reproduction Weevil. By R. C. Hall. 4 pp. Illus. U. S. Dept. of Agric., Washington 25, D. C. 1957. Forest Pest Leaflet No. 15. 5 cents (Govt. Print. Off.).

A Revision of the New World Species of Powder-Post Beetles Belonging to the Family Lyctidae. By E. J. Gerberg. Illus. U. S. Dept. of Agric., Washington 25, D. C. 1957. Tech. Bul. No. 1157. 35 cents (Govt. Print. Off.).

Silviculture

A Bibliography on Forest Genetics and Forest Tree Improvement 1955. By J. W. Wright. 60 pp. Northeastern Forest Expt. Sta., Upper Darby, Pa. 1957. Sta. Paper No. 90. Mimeog.

Forest Tree Planting Guide South Carolina. 1 p. South Carolina State Commission of Forestry, Columbia, S. C. 1957. Information Card No. 88.

Phenology of Rootstocks and Grafts in a Timing Experiment with Autumn and Winter Grafting of Norway and White Spruce. By M. J. Holst. 17 pp. Illus. Canada Dept. of Northern Affairs and National Resources, Ottawa. 1956. For. Res. Div. Tech. Note No. 48.

Results of the First Thirty Years of Experimentation in Silviculture in the Harvard Forest, 1908-1938; Part II Natural Reproduction Methods in White Pine-Hemlock Stands on Light Sandy Soils. By R. J. Lutz and A. C. Cline. 70 pp. Illus. Harvard Forest, Petersham, Mass. 1956. Bul. No. 27. 50 cents.

Thinning in Lodgepole Pine Stands in Alberta. By L. A. Smithers. 26 pp. Canada Dept. of Northern Affairs and National Resources, Ottawa. 1957. For. Res. Div. Tech. Note No. 52.

Tracheid Length Variation in Loblolly Pine. By P. R. Kramer. 22 pp. Illus. Texas Forest Serv., Lufkin. 1957. Tech. Rept. No. 10.

Wood Technology and Utilization

Practical R. F. Heating for the Wood Industry. By J. Pound. Heywood & Co., Ltd., Drury House, Russell St., London, W. C. 2. 1957. 30s. 0d.

Reaction Wood (Tension Wood and Compression Wood). 16 pp. Illus. Great Britain Dept. of Sci. and Indus. Research For. Prod. Lab., London. 1956. Leaflet No. 51.

Torsional Properties of Some Indian Timbers. By A. C. Sekhar and B. S. Rawat. 14 pp. Illus. Manager of Publications, Delhi, India. 1956. Indian Forest Bul. No. 202. Rs. 1/2/- or 1sh. 9d.

Weights and Specific Gravities of Indian Woods. By V. D. Limaye and B. R. Sen. Pp. 76-107. Manager of Publications, Delhi, India. 1956. Indian Forest Records (new ser.) Timber Mechanics. Vol. 1, no. 4. Rs.3-0 0 or 5sh.

Wood Specimens. Comp. by H. Kitao and others. . . . 180 natural specimens . . . in Japan. Stechert-Hafner, New York 3 (dealer). 1956. $40 (ltd. ed.).

The Yield of Sawmill Residue Pine Pulp Chips by Sawlog Size. By P. R. Kramer. 6 pp. Texas Forest Serv., Lufkin. 1957. Cir. No. 56. Mimeog.

Society Affairs

Officers and Council
1956-1957

DEWITT NELSON, *President*
Department of Natural Resources
315 State Office Building 1
Sacramento 14, Calif.

B. E. ALLEN
Union Bag-Camp Paper Corporation
P. O. Box 570
Savannah, Ga.

PHILIP A. BRIEGLEB
Southern Forest Experiment Station
704 Lowich Building
2026 St. Charles Avenue
New Orleans 13, La.

C. HUXLEY COULTER
Florida Forest Service
Tallahassee, Fla.

GEORGE A. GARRATT, *Vice President*
School of Forestry
Yale University
New Haven 11, Conn.

STANLEY G. FONTANNA
School of Natural Resources
University of Michigan
Ann Arbor, Mich.

MAURICE K. GODDARD
Department of Forests and Waters
Harrisburg, Pa.

EDWIN F. HEACOX
Weyerhaeuser Timber Company
Tacoma 1, Wash.

HENRY CLEPPER, *Executive Secretary*
Mills Building, 17th Street at Pennsylvania Avenue, N.W.
Washington 6, D. C.

JOSEPH S. ILLICK
College of Forestry
State University of New York
Syracuse 10, N. Y.

J. HERBERT STONE
U. S. Forest Service
729 N.E. Oregon St.
Portland 8, Ore.

HENRY J. VAUX
School of Forestry
University of California
Berkeley 4, Calif.

The President's Column

DEWITT NELSON

The Council held its semi-annual meeting in Berkeley on June 24 and 25, with all members present.

Many problems of current interest were discussed and acted upon. A full report of the meeting will be found in this issue of the Journal. I wish to comment on two of the items in which I am sure all members are interested.

In recent months there have been two proposals before the Council. One was for the combining of the Junior and Member grades into one grade of Member. The other was for the retention of the Junior grade and the establishment of the Senior grade in lieu of the Member grade.

On the first, the Council resolved not to combine the two grades.

On the second, the Council recognized the need for strengthening the distinction between the two grades to more adequately establish the level of competence which develops with additional training and experience. The need for this distinction has become more evident in recent years and will become increasingly important in the future. It was the Council's decision that hastily drafted criteria for the several types of membership would be premature and in the long run could be detrimental. The re-establishment of the Senior grade without well developed criteria could also be undesirable in the face of the Society's rapid growth and in light of the developments in forestry.

In view of these factors it was decided to designate a committee to study all grades and give the membership an opportunity to review the proposals and participate in the decisions. We expect to have a preliminary report at the Syracuse meeting.

For some years the Council has been confronted with the problem of more subject matter Divisions than can be properly accommodated at the annual meetings.

In view of this problem and the expression of many members, the Council resolved to rescind the Division on Private Forestry after December 31, 1957, because it is not a "subject matter Division." It combines naturally with Management, Silviculture, and Economics in which all types of employment or ownership have a common interest.

In addition, the Council resolved to discontinue the Division of Public Relations because this activity cuts across all fields of endeavor and should be integrated into the other subject matter Divisions. This action will also become effective on December 31, 1957.

There will be those who will take exception to these actions. The pros and cons of these problems have been discussed many times in recent years. After reviewing the arguments it was the unanimous decision of the Council that the action as stated be taken, in the belief that the members attending the annual meeting would gain more value if fewer Divisions were running concurrently.

See you in Syracuse November 10 to 13, 1957.

DeWitt Nelson

Annual Meeting

Society of American Foresters
Syracuse, N. Y. November 10-13, 1957
Theme: "Forest Land Use in Transition"

Schedule of Events

Members, their ladies, and guests who plan to attend the Society's 57th annual meeting are urged to arrive in Syracuse on Sunday, November 10, in order to visit the College of Forestry where there will be "open house" from 2 to 5 p.m.

The open general session will start at 9:30 a.m., Monday morning in the ballroom of the Syracuse Hotel.

The following program for the various activities is up to date as of the time of going to press. The final program will be published in the September issue.

General Meeting

Monday, November 11

Dwight B. Demeritt, Chairman

Morning Session

Theme: "Forest Land Use in Transition"

1. "The Northeast's Forest Heritage." Ralph W. Marquis, Northeastern Forest Experiment Station, Upper Darby, Pa.
2. "Impact of Shifting Land Use Patterns on Forest Policies and Programs." E. W. Littlefield, Division of Lands and Forests, New York Conservation Department, Albany, N. Y.
3. "Effect of Land Use Trends on Forestry Needs and Opportunities." George A. Garratt, School of Forestry, Yale University, New Haven, Conn.

Society Affairs Session

Monday afternoon, November 11

DeWitt Nelson, President
George A. Garratt, Vice President
Henry Clepper, Executive Secretary

1. Report of the President.
2. Report of the Executive Secretary.
3. Report of the editor of Society publications, Arthur B. Meyer.
4. Report of the editor of *Forest Science*, S. H. Spurr.
5. Committee reports.

Division of Forest Recreation

Monday evening, November 11

James P. Gilligan, Chairman
Felix C. Koziol, Vice Chairman
Frank W. Childs, Secretary

1. "The National Outdoor Recreation Resources Review."
2. "Plans and Problems of the U. S. Forest Service Operations Outdoors." Edward P. Cliff, Branch of National Forest Resource Management, U. S. Forest Service, Washington, D. C.
3. "Recreational Development in the Forest Preserves of New York." William M. Foss and W. D. Mulholland, Division of Lands and Forests, New York State Conservation Department, Albany, N. Y.
4. "Recreation versus Forest Products in Land Use Planning." Frank W. Childs, National Park Service, Omaha, Nebr.

Division of Watershed Management

Monday evening, November 11

E. G. Dunford, Chairman
Peter W. Fletcher, Vice Chairman
Sidney Weitzman, Secretary

1. "Watershed Problems in New York State." H. G. Wilm, State University of New York, College of Forestry, Syracuse, N. Y.
2. "Forest Watershed Problems and Opportunities in the Northeast." Howard Lull and Norman R. Tripp, Northeastern Forest Experiment Station, Upper Darby, Pa.
3. "Municipal Watershed Management in Practice." John M. Heilman, Division of Water Supply, Newark, N. J.
4. "The Economics of Watershed Management." G. R. Gregory, School of Natural Resources, University of Michigan, Ann Arbor, Mich.

Division of Education

Monday evening, November 11

David M. Smith, Chairman
A. Bigler Crow, Vice Chairman
Peter W. Fletcher, Secretary

"Field Use of Libraries." Martha Meelig, College of Forestry, State University of New York, Syracuse, New York.

Symposium: Encouraging the Best Qualified Young Men to Enter Forestry.

1. Report of the Society Committee on Career Counselling. T. D. Stevens, Department of Forestry, Michigan State University, East Lansing, Mich.
2. "What Does Forestry Have to Offer America's Top Students Today?" Bernard A. Anderson, Division of Personnel Management, U. S. Forest Service, Washington, D. C.
3. "The Public Relations Approach to Recruiting Forestry Students." Floyd E. Carlson, College of Forestry, State University of New York, Syracuse, N. Y.

Division of Silviculture

Tuesday, November 12

Henry I. Baldwin, Chairman
James D. Curtis, Vice Chairman
Earl H. Tryon, Secretary

Morning Session

1. "Oak Wilt: Its Significance,

Coming Events

Northeastern Forest Tree Improvement Conference

The Northeastern Forest Tree Improvement Conference will be held in Orono, Maine, August 22 and 23.

Soil Conservation Society

The Soil Conservation Society of America will hold its 12th annual meeting August 28-31, 1957, at Asilomar Beach State Park, Pacific Grove, Calif.

Ozark Section Meeting

The Ozark Section will meet September 5-7 in Branson, Mo.

National Watershed Congress

The National Watershed Congress is scheduled for September 23-25 in the Biltmore Hotel, Atlanta, Ga.

American Forestry Association

The 82nd annual meeting of the American Forestry Association will be held September 30-October 3, at Madison, Wis. Theme: "Wood Products on Parade."

Western Forestry and Conservation Assn.

The Western Forestry and Conservation Association will hold its 48th annual conference December 11-13 in Seattle, Wash. Theme: "The business of tree farming."

Spread, and Prevention." A. J. Riker, Department of Plant Pathology, University of Wisconsin, Madison, Wis.

2. Panel discussion: "The Place of Tree Improvement in Forest Pest Control."

Moderator, Harold J. Lutz, School of Forestry, Yale University, New Haven, Conn.

"The Possibilities and Limitations of Breeding for Pest Resistance in Forest Trees." Ernst J. Schreiner, Division of Forest Genetics, Northeastern Forest Experiment Station, Upper Darby, Pa.

"The Outlook for Breeding Trees Resistant to Insects." James A. Beal, Division of Forest Insect Research, U. S. Forest Service, Washington, D. C.

"Limitations of Tree Breeding and Selection in the Control of Disease." John S. Boyce, Osborn Botanical Laboratory, Yale University, New Haven, Conn.

3. "Height Growth of 81 Progenies of Ponderosa Pine." R. Z. Callaham and A. A. Hasel, California Forest and Range Experiment Station, Berkeley, Calif.

4. "Some Factors Affecting Freedom from Knots in Loblolly Pine Lumber." William C. Hopkins, School of Forestry, Louisiana State University, Baton Rouge, La.

5. "Seed Regeneration in Florida." Robert W. Cooper, Southeastern Forest Experiment Station, Lake City, Fla.

6. "Effect of Storage Conditions on the Viability of Rocky Mountain Tree Pollens." Gilbert H. Fechner, College of Forestry and Range Management, Colorado State University, Fort Collins.

7. "Windfall in Minnesota Swamp Black Spruce in Relation to Cutting Methods." M. L. Heinselman, Lake States Forest Experiment Station, Grand Rapids, Minn.

Afternoon Session

1. Business meeting. Election of officers.

2. Report of the Committee on Stocking. C. A. Bickford, Northeastern Forest Experiment Station, Upper Darby, Pa.

3. Report of the Committee on Tree Improvement. Scott S. Pauley, School of Forestry, University of Minnesota, St. Paul, Minn.

4. "Forest Weed Control." Robert R. Morrow, Jr., Department of Conservation, Cornell University, Ithaca, N. Y.

Division of Private Forestry

Tuesday morning, November 12

William C. MacAdam, Chairman
George V. Hjort, Vice Chairman
George W. Abel, Secretary

1. "Terminating Federal Supervision over Indian Forests." Kenneth B. Pomeroy, American Forestry Association, Washington, D. C.

2. "Fifty Years of Industrial Forestry with the Empire State Forest Products Association." Nelson C. Brown, Syracuse, N. Y., and A. B. Recknagel, Ithaca, N. Y.

3. "Significance of Price Reporting in Forestry." A. C. Shaw, Champion Paper and Fibre Company, Hamilton, Ohio.

4. Panel Discussion: "Forest Management by Private Foresters in the Northeast."

Moderator, William P. House, Consulting forester, Chesham, N. H.; Robert Moore, Consulting Forester, Danville, Pa.; James D. Pond, Pond and Moyer Company, Ithaca, N. Y.

Division of Forest-Wildlife Management

Tuesday morning, November 12

William L. Webb, Chairman
Elbert H. Reid, Vice Chairman
Odell Julander, Secretary

1. "The Future of Statewide Deer Herd Management." Dale A. Jones, Division of Game Management, Utah Department of Fish and Game, Salt Lake City, Utah.

2. "Future Role of State Conservation Departments in Forest-Wildlife Management." Frank B. Barick, Game Division, North Carolina Wildlife Resources Commission, Raleigh, N. C.

3. "Future Role of Federal Agencies in Forest-Wildlife Management." Clarence Cottam, Rob and Bessie Welder Wildlife Foundation, Sinton, Tex.

4. "Future of Forest-Wildlife Management in the Plans of Woodland Owners." Arthur L. Bennett, Department of Woodlands Operations, Armstrong Forest Company, Johnsonburg, Pa.

5. "Will There be a Transition from Free Public Hunting to Paid Shooting?" Edward L. Kozicky, Conservation Department, Olin Mathieson Chemical Corporation, East Alton, Ill.

6. Business meeting.

Division of Forest Products

Tuesday afternoon, November 12

Stephen B. Preston, Chairman
Harry E. Troxell, Vice Chairman
Bernard W. Granum, Secretary

1. "Changes in the Wood-Using Industry Accompanying Changes in Forest Resources." Raymond J. Hoyle, College of Forestry, State University of New York, Syracuse, N. Y.

2. "Quality of Lumber which is not Measured by Grade." James S. Bethel, School of Forestry, North Carolina State College, Raleigh, N. C.

3. "Suitability of Eastern White Pine and Red Pine for Veneer and Plywood." John F. Lutz, Forest Products Laboratory, Madison, Wis.

4. "The Use of Bolter Saws in Conversion of Small Hardwood Logs." Richard M. Pierce, Forster Manufacturing Company, Farmington, Maine.

5. "The Reaggregated Wood Products Industry and What it Means to Intermediate and Salvage Cuttings." Paul J. Bois, Southeastern Forest Experiment Station, Asheville, N. C. and Arthur H. Haigh, Jr., Morgan Manufacturing Company, Black Mountain, N. C.

6. "Factors Contributing to the Increased Utilization of West Coast Hardwoods." Fred E. Dickinson, California Forest Products Laboratory, Richmond, Calif.

Division of Public Relations

Tuesday afternoon, November 12

Charles W. Mattison, Chairman
Fred E. Winch, Jr., Vice Chairman
J. Walter Myers, Jr., Secretary

Program not received.

Division of Forest Management

Wednesday, November 13

Gerald S. Wheeler, Chairman
Walter F. McCulloch, Vice Chairman
E. W. Littlefield, Secretary

Morning Session

1. "Massachusetts' Land Classification Mapping Project." William P. MacConnell, Department of Forestry and Wildlife Management, Amherst, Mass.

2. "A Trial Run in Continuous Forest Inventory in Canada." R. G. Belcher, Canadian International Paper Company, Montreal, P. Q., Canada.

3. "Pulpwood Procurement in a Metropolitan Region." Stanley A. Hamilton, West Virginia Pulp and Paper Company, Mechanicville, N. Y.

4. "Some Problems of Tropical Forest Management." Sir Herbert Howard, Commonwealth Agricultural Bureaux, Farnham Royal, Bucks, England.

Afternoon Session

1. "Adapting the Management of a Large Tract of Private Timberland to Industrial Needs." Dwight B. Demeritt, Dead River Company, Bangor, Maine.

2. "Pilot Woodland Management Program in New Hampshire." Kenneth E. Barraclough, Extension Service, University of New Hampshire, Durham, N. H.

3. "Air Attack on Forest Fires." M. M. Nelson, Division of Fire Control, U. S. Forest Service, San Francisco, Calif.

4. "Growing Importance of Hardwoods to the Paper Industry in the Northeast." Gerald A. Pesez, International Paper Company, Glens Falls, N. Y.

5. Business meeting.

Division of Range Management

Wednesday morning, November 13

Elbert H. Reid, Chairman
Grant A. Harris, Vice Chairman
Joe A. Wagner, Secretary

Program not received.

Division of Forest Economics and Policy

Wednesday morning, November 13

Carl H. Stoltenberg, Chairman
S. Blair Hutchinson, Vice Chairman
Ernest M. Gould, Jr., Secretary

Panel Discussions

1. "Forest Taxation Problems: How Serious and for Whom?"

Moderator, William A. Duerr, College of Forestry, State University of New York, Syracuse, N. Y.

2. "What Can be Accomplished?"

"By Improving the Property Tax: Some Promising Developments."

Moderator, Ellis T. Williams, Division of Forest Economics Research, U. S. Forest Service, Washington, D. C.

"By Special Forest Tax Laws: Lessons from New Hampshire."

Moderator, William B. House, Consulting Forester, Chesham, N. Y.

The Annual Dinner

Wednesday evening, November 13

Maurice K. Goddard, Toastmaster

Presentation of award for outstanding achievement in biological research contributing to the advancement of forestry.

Address by Fairfield Osborn, president of the Conservation Foundation, New York, N. Y.

Entertainment.

Field Trips

Plans are being prepared for four field trips on November 8 and 9 (Friday and Saturday) *immediately preceding the meeting.* Three of them are to be of one-day duration, leaving Syracuse in the morning and returning in the evening.

If desired, two of these trips can be selected, one on Friday and one on Saturday. The fourth trip will require two days, leaving Syracuse Friday morning and returning to Syracuse Saturday evening.

Travel is to be by chartered bus.

Advance registration will be required to permit arrangements for transportation and for food and lodging where these are needed. More details will appear in the September issue of the JOURNAL.

The field trips planned are:

1. A one-day trip to observe a wide range of land uses in an area where some of the land has completed the cycle of forest to farm, to idle land, to forest, but where aggressive urban development is forcing drastic changes in planners' long-term views. Here, too, will be an opportunity to study the impact of superhighways on land use. One such road is in operation across the area east and west, and another is under construction north to south.

2. A one-day trip to visit plantations in central New York, where large areas of land were purchased by the state and planted to conifers during the 1930's. The problems of management, with emphasis on pruning and thinning, accessibility and labor supply, and future development of the plantations will be presented.

3. A one-day trip to visit some of the most productive woodlots in central New York, and the Montezuma National Wildlife Refuge. Management and yield information for the woodlots visited will be presented. The program of the wildlife refuge will be explained.

4. A two-day trip to visit the southern Adirondack region. Emphasis on this trip will be placed on visits to the 7,000-acre Luther Forest near Saratoga Springs, and the Pack Demonstration Forest near Warrensburg. Luther Forest, a privately owned forest property containing over 3,000 acres of coniferous plantations, has long served as an example of intensive forest management. The Pack Demonstration Forest of the College of Forestry provides many examples of effective practices in the management and utilization of white pine. The research program of the forest will also be presented.

Hotel Reservations

Those expecting to attend the meeting are urged to arrive in Syracuse on Sunday, November 10. There will be open house at the College of Forestry from 2 to 5 p.m., with conducted tours of the college buildings and the new $4 million Hugh P. Baker Forest Products Laboratory.

The Syracuse Hotel will be the headquarters for the meeting. This hotel has 600 rooms, but it will not be able to accommodate all those in attendance, hence other hotels are making space available. The Onondaga Hotel (500 rooms) is one block from the Syracuse. Other convenient hotels are listed.

All requests for room reservations should be sent to the SAF Housing Committee, in care of the Chamber of Commerce, 351 South Warren Street, Syracuse 2, N. Y. Second and third choices should be given.

Reservations will be accepted and confirmed in the order of their receipt. Assignment of rooms will be made at the desired rate or as near as possible. Early reservation requests are desirable.

The reservation coupon printed herewith may be used. However, readers who do not want to cut the coupon from their JOURNALS may request reservations by letter, providing all the information listed on the coupon.

Single rooms will be scarce, hence when possible twin-bed rooms should be requested.

Hotels

All rates quoted are with bath.

Syracuse Hotel, 500 South Warren Street; 600 rooms. Single rooms, $6.50 to $11; double-bed rooms for two, $10.50 to $13; twin-bed rooms, $11.25 to $14.50; parlor suites, $19.50 to $40; additional bed, $2.50.

Onondaga Hotel, South Warren at East Jefferson Street (one block from Syracuse Hotel); 500 rooms. Single rooms, $6.25 to $10.50; double-bed rooms for two, $9.50 to $12.50; twin-bed rooms, $10.25 to $14; suites for two, $20; additional day bed, $3.

Yates Hotel, Montgomery and East Washington Streets (three blocks from Syracuse Hotel); 200 rooms. Single rooms, $5.50 and $7; double-bed rooms for two, $7.50 and $9; twin-bed rooms, $9 and $10; three twin-beds, $12 and $13.

Mizpah Hotel, 215 East Jefferson Street (two blocks from Syracuse Hotel); 120 rooms. Single rooms, $5 and $5.50; double-bed rooms for two, $7 and $8; twin-bed rooms, $8.

Hotel Jefferson-Clinton, West Jefferson and South Clinton Streets (four blocks from Syracuse Hotel); 140 rooms. Single rooms, $5.50 to $8; double-bed rooms for two, $8 to $9; twin-bed rooms, $8 to $12.

Hilton Hotel, 238 Harrison Street (two blocks from Syracuse Hotel); 105 rooms. Single rooms, $5 and $6; double-bed rooms for two, $7 and $8; twin-bed rooms, $8.

Seymour Hotel, 361 East Onondaga Street (four blocks from Syracuse Hotel); 95 rooms. Single rooms, $3.50 and $4; double-bed rooms, $5.

Wood Hotel, West Jefferson and Clinton Streets (three blocks from Syracuse Hotel (55 rooms). Single rooms, $4 and $5; double-bed rooms, $5.50 and $7; twin-bed rooms, $6 and $8.

Truax Hotel, South Warren and Harrison Streets (one block from Syracuse Hotel); 50 rooms. Single rooms, $4.50; double-bed rooms, $7; twin-bed rooms, $7.50.

Motels and Motor Lodges

There are seven motels and tourist courts in Syracuse. Those wishing this type of accommodation may obtain a list of them with their locations and rates from the Chamber of Commerce, 351 South Warren Street, Syracuse 2.

Usually an advance deposit is necessary to hold a motel reservation.

Committees for the Meeting

Hardy L. Shirley is general chairman for the meeting. Assisting him is John R. Meyering. Their address is College of Forestry, State University of New York, Syracuse 10, N. Y.

Program Committee

Paul M. Dunn is chairman of the Program Committee. His address is St. Regis Paper Company, 150 East 42nd Street, New York 17, N. Y.

The other members of the committee are William R. Adams, Henry I. Baldwin, E. W. Littlefield, and Roy W. Olson.

Committee on Arrangements

S. O. Heiberg is chairman of the Committee on Arrangements. Assisting him is John W. Barrett. Both are with the College of Forestry.

Special assignments on this committee have been made as follows:

Ladies Activities. Mrs. Ralph Unger.

Information and Publicity. Ralph G. Unger.

Field Trips. Neil Stout.

Exhibits. Russell C. Deckert.

Hotels and Housing. Paul F. Graves.

Registration and Welcome. Floyd E. Carlson.

Meeting Rooms. Howard C. Miller.

Projection and Public Address

SOCIETY OF AMERICAN FORESTERS

Annual Meeting

Syracuse, N. Y. November 10-13, 1957

Housing Committee, Society of American Foresters,
c/o Chamber of Commerce Convention Bureau,
351 South Warren Street,
Syracuse 2, New York,

First choice hotel _____

Second choice hotel _____

Third choice hotel _____

Please make a reservation for the following room accommodations for arrival on November ____, a.m. p.m. Departure date ____, a.m. p.m.

I understand that accommodations will be provided at the daily rate specified, if available; otherwise the next nearest rate will apply.

____ Single room with bath. Rate $____.

____ Double-bed room with bath. Rate $____.

____ Twin-bed room with bath. Rate $____.

____ Suite (parlor, twin-bed room, and bath). Rate $____.

____ Other. (Specify accommodations desired.) _____

_____ Rate $____.

The above room accommodations are requested for the following persons, in addition to myself. (Please print or typewrite names and addresses legibly.)

_____

_____

_____

My name: _____

Street address: _____

City, zone, state: _____

Equipment. Wilfred Cote.
Forestry Films. John Fedkiw.
Banquet. Kenneth C. Painter.
College of Forestry Reception. Harold G. Wilm.
Alumni Reunions. Neil J. Stout.

Seventh Call for Council Nominations

All members are hereby notified that the regular biennial election will be held December 2, 1957. A president, vice president, and nine other members of the Council will be elected for the two-year term 1958-1959.

The present Council is listed in the box on page 597. Any or all of these incumbents may be renominated, provided they accept the nomination in writing.

President DeWitt Nelson has announced that he will not be a candidate for re-election.

Membership on the Council is restricted by the Constitution to Members (formerly Senior Members) and Fellows. Any Member or Fellow is eligible to hold office who is in good standing and who accepts the nomination in writing and declares his willingness to serve if elected.

Each voter will have an opportunity to ballot on all candidates for office. Council members are elected in accordance with the system of proportional representation. The procedure of proportional representation will be explained in a later issue of the JOURNAL. It is the system by which the Society has been electing Council members for over two decades.

Candidates for the office of president are voted on separately; the candidate who receives the highest vote is declared elected president, and the candidate who receives the next highest vote is declared elected vice president.

How Nominations Are Made

The Constitution (Article VIII, Section 2) states the conditions under which nominations are made by petition.

1. Each petition shall name but one candidate.

2. All candidates must be eligible to hold elective office.

3. A petition shall bear the signatures of at least ten voting members who at the time of signing the petition are eligible to vote in the coming election. (Eligible voting members are Junior Members, Members, and Fellows in good standing.)

4. A voting member may not sign more than one nominating petition for president, nor more than one nominating petition for a member of the Council. That is, he may sign two, but no more.

5. Petitions must be in the Society office by September 18, 1957.

The Society has no special form for submitting nominating petitions. They may be written as follows:

We, the undersigned voting members of the Society of American Foresters, hereby nominate John Doe, a Member (or Fellow) for the office of president (or member of the Council) for the two-year term 1958-1959.

A nomination is not valid until the candidate has accepted the nomination in writing. His acceptance should accompany the nominating petition, and may be written as follows:

I accept the nomination to the Council of the Society of American Foresters for the two-year term 1958-1959, and agree to serve if elected.

All nominating petitions should be sent promptly to the Society office. The executive secretary will gladly provide information about nominating or election procedure.

According to the Constitution (Article VIII, Section 1) a Nominating Committee has been appointed by President Nelson. The Committee is composed of the following members:

Chairman, J. H. Johnson, Chesapeake Corp. of Virginia, Box 534, West Point, Va.

Albert Engstrom, Oklahoma Division of Forestry, Capitol Building, Oklahoma City, Okla.

James E. Sowder, Deschutes Research Center, U. S. Forest Service, Bend, Ore.

Harry E. Troxell, School of Forestry, Colorado A & M College, Fort Collins, Colo.

This committee is charged with the following duties:

1. To set the date of the election. (December 2, 1957 is the date.)

2. To provide for at least two candidates for the office of president, and at least nine candidates for membership on the Council.

3. To receive separate nominating petitions for the office of president and for each member of the Council, and to supplement such petitions when necessary with other nominations in order to comply with item 2 above.

The Nominating Committee will make no nominations of its own unless the voting membership fails to make the required minimum number of nominations by petition. Voting members should accordingly get busy and make their own nominations. For their information the distribution of Council members by states during the period 1942-1957 is shown on page 388 of the May issue of the JOURNAL.

Nominations Received

Up to the time of going to press the following nominations had been received:

For President

George A. Garratt, New Haven, Conn. (Vice president, 1956-1957).
Henry J. Malsberger, Atlanta, Ga.

For The Council

B. E. Allen, Savannah, Ga. (Council member, 1956-1957.)
Philip A. Briegleb, New Orleans, La. (Council member, 1956-1957.)
S. T. Carlson, Santa Fe, N. Mex.
Donald E. Clark, Denver, Colo.
Chas. A. Connaughton, San Francisco, Calif.
Kenneth P. Davis, Ann Arbor, Mich.
M. B. Dickerman, St. Paul, Minn.
Glen R. Durrell, Stillwater, Okla.
M. K. Goddard, Harrisburg, Pa. (Council member, 1956-1957.)
William D. Hagenstein, Portland, Ore.
P. T. Lannan, Georgetown, S. C.
A. D. Nutting, Orono, Maine.
Russell Stadelman, Memphis, Tenn.
J. Herbert Stone, Portland, Ore. (Council member, 1956-1957.)
Henry J. Vaux, Berkeley, Calif. (Council member, 1956-1957.)
Ernest Wohletz, Moscow, Idaho.

J. H. JOHNSON, *chairman,*
Nominating Committee

Seventh Call for Fellow Nominations

All Members (formerly Senior Members) and Fellows of the Society are

hereby advised that nominations for the grade of Fellow are now open. The election of Fellows will be held at the time of the Society's regular biennial election, December 2, 1957.

As defined by the Constitution (Article III, Section 7), "Fellows shall be foresters of outstanding achievement as leaders in responsible directive or distinctive individual work of a fruitful character. They shall be elected from the Members and shall be engaged in forestry work at the time of their election."

Nominations by Petition

The procedure for placing Members in nomination for the grade of Fellow is by petition. The Society has no printed form for this purpose; the petition may be typewritten thus:

We, the undersigned Members and Fellows of the Society of American Foresters, hereby nominate John Doe for election to the grade of Fellow in 1957.

Remember these simple rules:

1. A petition may not name more than one candidate.

2. It must be signed by 25 Members or Fellows in good standing.

3. It should be accompanied by a factual, not eulogistic, biographical sketch of at least 200 words giving an account of the nominee's professional career and accomplishments.

4. It must be received in the executive office of the Society in Washington, D. C., not later than September 18, 1957.

The executive employees of the Society cannot be responsible for obtaining signatures on partially completed petitions or on petitions incomplete by reason of unacceptable signatures (that is, signatures of other than Members and Fellows in good standing).

Election Procedure

Fellows are not elected by the membership at large, but by a board of electors which consists of all present Fellows and the present Council. (A Council member who is also a Fellow has but one vote.)

The system is described in Article IV, Section 4 of the Constitution. To win election a candidate must receive an affirmative vote of not less than one-half the total votes cast.

During 1957, the voting membership of the Society will have an opportunity to ballot on a proposal by the Council that would increase the number of Fellow electors. If the referendum is approved, the chairmen of the 21 Sections and the chairmen of the 11 subject Divisions, a total of 32 electors, will cast votes for Fellows in addition to the present Fellows and the Council. For a detailed discussion of this proposal members are referred to the JOURNAL for April 1956, page 279, and for June 1956, page 410.

Significance of the Grade

The highest membership distinction that can be conferred by the Society, this grade is awarded in recognition of outstanding achievement. Fellows do not pay increased dues; their dues are the same as those of Members.

Since the Society was founded in 1900, there have been 109 Fellows elected. At the present time the number of living Fellows is 75.

Fellow Nominations

On the date of going to press, the following Members had been nominated for the grade of Fellow:

Walter E. Bond, New Orleans, La.
C. Huxley Coulter, Tallahassee, Fla.
Charles C. Cowan, Seattle, Wash.
James F. Dubuar, Wanakena, N. Y.
Paul M. Garrison, Bogalusa, La.
Edwin F. Heacox, Tacoma, Wash.
Svend O. Heiberg, Syracuse, N. Y.
Norman G. Jacobson, Tacoma, Wash.
Richard Kilbourne, Norris, Tenn.
Harvey J. MacAloney, St. Paul, Minn.
Richard V. Miles, Jr., Tuscaloosa, Ala.
DeWitt Nelson, Sacramento, Calif.
Earl Porter, Mobile, Ala.
Jacob M. Stauffer, Montgomery, Ala.
Philip C. Wakeley, New Orleans, La.

List of Fellows

The current roster of Fellows follows. The state in which each Fellow is domiciled and the year of his election are shown after his name.

Allen, Shirley W. Michigan. 1948.

Bailey, Reed W. Utah. 1955.
Baker, Frederick S. California. 1949.
Besley, Fred W. Maryland. 1940.
Boyce, John S. Connecticut. 1955.
Brundage, Frederick H. Oregon. 1949.
Butler, Ovid. Maryland. 1940.

Carter, E. E. District of Columbia. 1942
Chapman, Herman H. Connecticut. 1922.
Clapp, Earle H. District of Columbia. 1930.
Clepper, Henry E. Virginia. 1949.
Coffman, John D. California. 1946.
Cox, William T. Minnesota. 1953.
Curran, Hugh. Venezuela. 1951.

Damtoft, Walter J. North Carolina. 1951.
Dana, Samuel T. Michigan. 1935.
Demeritt, Dwight B. Maine. 1955.
Demmon, Elwood L. North Carolina. 1951.
Detwiler, Samuel B. Colorado. 1955.
Drake, George L. Washington. 1953.

Eldredge, Inman F. Lousiana. 1942.
Evans, Charles F. Georgia. 1949.
Evenden, J. C. Idaho. 1953.

Ferguson, J. A. Pennsylvania. 1949.
Fischer, Arthur F. California. 1940.
Fontanna, Stanley G. Michigan. 1955.
Fritz, Emanuel. California. 1951.
Frothingham, E. H. California. 1942.

Garratt, George A. Connecticut. 1953.
Gill, Tom. District of Columbia. 1948.
Granger, Christopher M. Maryland. 1946.
Guise, Cedric H. New York. 1951.
Guthrie, John D. Virginia. 1942.

Hall, J. Alfred. Wisconsin. 1955.
Hall, William L. Arkansas. 1940.
Hartley, Carl P. Maryland. 1949.
Hawes, Austin F. Connecticut. 1939.
Hawley, Ralph C. Connecticut. 1942.
Heintzleman, B. Frank. Alaska. 1951.
Holmes, J. S. North Carolina. 1939.
Hosmer, Ralph S. New York. 1932.
Hunt, George M. Wisconsin. 1951.

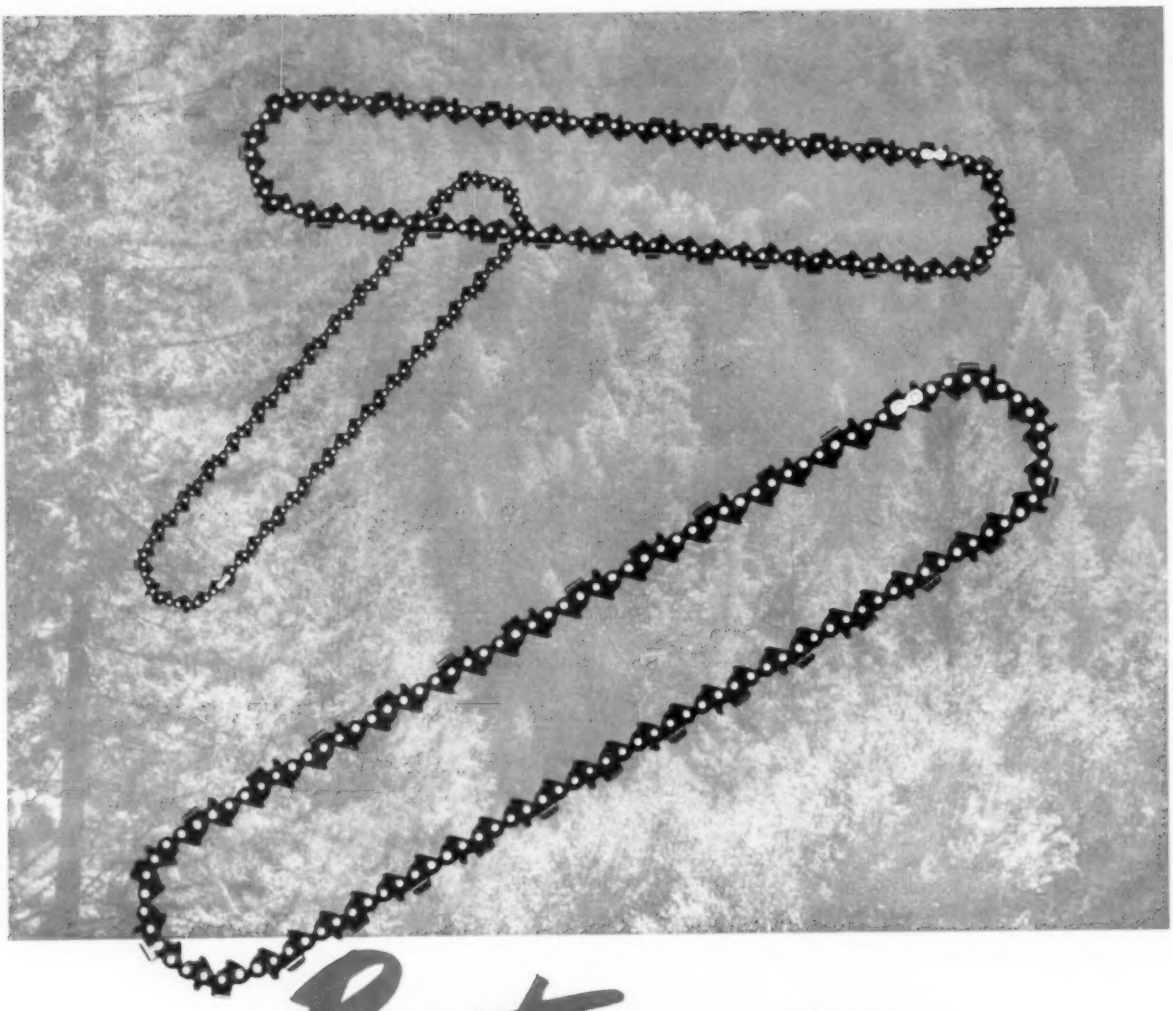
Illick, Joseph S. New York. 1946.
Isaac, Leo A. Oregon. 1953.

Jeffers, Dwight S. Oregon. 1948.

Kaufert, Frank H. Minnesota. 1955.
Keen, Frederick P. California. 1955.
Kelley, E. W. California. 1949.
Kellogg, Royal S. Florida. 1949.
Kinney, Jay P. New York. 1942.
Kittredge, Joseph. California. 1953.
Korstian, Clarence F. North Carolina. 1942.
Krueger, Myron E. California. 1951.
Lowdermilk, Walter C. California. 1948.

MacDonald, G. B. Iowa. 1944.
Marckworth, Gordon D. Washington. 1955.
Marsh, Raymond E. District of Columbia. 1948.
Martin, Clyde S. Washington. 1948.
Mason, David T. Oregon. 1948.
McArdle, Richard E. District of Columbia. 1953.
Metcalf, Woodbridge. California. 1953.
Morrell, Fred W. Virginia. 1951.
Munger, Thornton T. Oregon. 1946.
Munns, Edward N. California. 1949.

Preston, John F. District of Columbia. 1948.
Price, Jay H. Arizona. 1951.



Best in its field

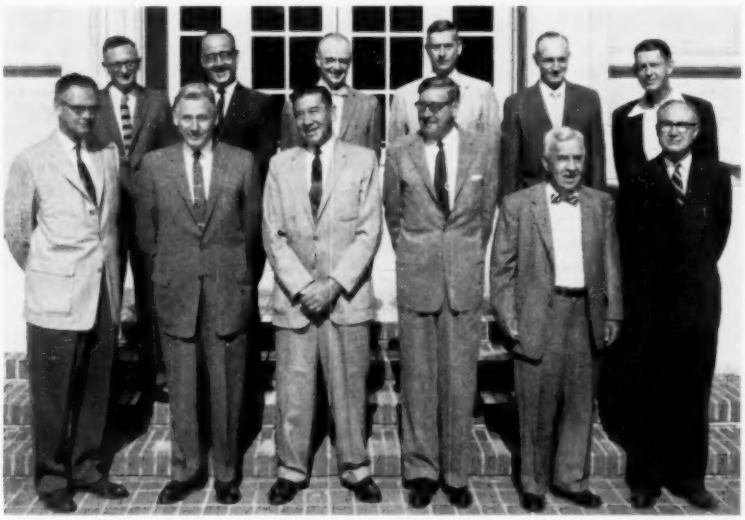
Manufactured to closer tolerances under rigid inspection, the new "43 series" (7/16 pitch) BlueJet saw chains are the fastest cutting, smoothest running chains on the market today.

This new series gives you the advantages of these manufacturing extras:

- Precision-ground, *uniform* routers hold a keen edge longer.
- Side link and router bar-riding surfaces are *shaved* to assure absolute flatness, give better wear to both chain and bar.
- Guide link rivet holes are machine *reamed* to provide greater bearing surface, resulting in longer chain life.
- Side link and router rivet holes are *countersunk* to eliminate chain stretch and sloppiness.

BLUEJET
CORPORATION
HOPEDALE, MASSACHUSETTS, U.S.A.
A Subsidiary of Draper Corporation

Schmitz, Henry. Washington. 1940.
Shirley, Hardy L. New York. 1951.
Show, S. B. California. 1948.
Siecke, E. O. Texas. 1946.
Sparhawk, William N. New Hampshire. 1946.
Watts, Lyle F. Oregon. 1946.
Winslow, C. P. Washington. 1942.
Wirt, George H. Pennsylvania. 1948.
Ziegler, E. A. Pennsylvania. 1949.



MEMBERS of the Council of the Society of American Foresters meeting at Berkeley, Calif. June 24. Top row: H. J. Vaux, B. E. Allen, J. H. Stone, M. K. Goddard, P. A. Briegleb, C. H. Coulter. Bottom row: E. F. Heacox; G. A. Garratt, vice president; DeWitt Nelson, president; Henry Clepper, executive secretary; J. S. Illick; S. G. Fontanna.

Report of Council Meeting

The regular midyear meeting of the Council of the Society of American Foresters was held at the School of Forestry, University of California, Berkeley, on June 24 and 25, 1957.

All members were present, as follows: President DeWitt Nelson, Vice President George A. Garratt, B. E. Allen, P. A. Briegleb, H. C. Coulter, S. G. Fontanna, M. K. Goddard, E. F. Heacox, J. S. Illick, J. H. Stone, and H. J. Vaux; together with Henry Clepper, executive secretary.

Bylaw 75 Repealed

"Bylaw 75. Nonmembers of the Society may become Associate Members of a Section but may not become regular members or serve as officers of a Section. This applies to former members of the Society whose membership has been terminated, as well as to those who never have been members."

Under this bylaw people who were not qualified for any grade of membership were still able to establish formal affiliation with individual Sections. The principal advantage of the bylaw appears to have been in sparsely settled areas where there were insufficient qualified members to sustain an active forestry group. The bylaw made it possible to include loggers, tree farmers, cattlemen, legislators, and many other people having a community of interest with foresters in a Section and to take advantage of the benefits accruing from such formal affiliation.

There was opposition to this bylaw, however, on the following grounds:

1. The reasons for the original establishment of the bylaw (described above) were no longer valid in many areas;

2. The general public was not aware of the distinction between the grade of Section Associate and the several grades of membership in the Society, and could thus be misled as to a man's technical competence on the basis of his Section Associate status:

3. Some members believed it unwise to have, in effect, a different membership standard at national and sectional levels; and

4. It is possible that there has

TO GET ALL THESE SAVINGS
In TIME, PAINT, and MONEY

NOZZLE CAP
To prevent paint drying-in — Another Nelson exclusive, saves nightly cleaning.

REVERSIBLE NOZZLE
To eject plugs quickly, cuts "time out" to clear clogged guns.

ADAPTOR AND QUART CAN
Permits screwing can direct to gun — eliminates funnels, canteens and sloppy paint transfers.

NON-SETTLING PAINT
Saves hours wasted in stirring — makes marks that endure and twice as many per gallon.

USE BOTH THE NEL-SPOT GUN and NELSON TREE MARKING PAINT

Both save time. Both save paint. Use them together and Nelson's Paint-Can-Gun, "all 3 in one," mark more trees for less money than any other combination of paint and marking tools you can buy.

WRITE — Dept. JF-12

THE NELSON COMPANY
1236 Prospect Avenue
Iron Mountain, Michigan

CUT COSTS 90%
PREVENT ACCIDENTS
• WASH WINDOWS FOUR STORIES HIGH
REMOVE LIGHT GLOBES 60 ft. up
• PRUNE TREES & PICK FRUIT 60 ft. up

Send for Free Catalog
DEPT. J . 300 S. Los Angeles St., L.A. 13, MA 6-9397

NEW REGULATION FIELD CLOTHES
for
U. S. FOREST SERVICE PERSONNEL
Complete Price List on Request
THE FECHHEIMER BROS. CO.
UNIFORMS FOR OVER 75 YEARS
CINCINNATI 2, OHIO

GROW TREES
FOR XMAS TREES AND FORESTRY
Fir, Pine and Spruce in Variety
Seedlings and Transplants
Write for Price List
Suncrest Evergreen Nurseries
P.O. Box 305-G, Homer City, Penna

COMPLETE INVENTORY CRUISING SCALE

Hypsometer Biltmore Scale
Rigid When Open
Flexible 6-foot Steel Tape $3.00 EACH
Handy Chrome-plated Case 1¾" Dia.
CARL W. GETZ, President
KURFEW, INC.
Lansdale, Pa.

been some abuse by Section Associates posing as foresters on the basis of this kind of Section membership.

At the Council meeting on October 14, 1956, the Council Membership Committee recommended that Bylaw 75 be repealed. Such repeal would eliminate the difficulties mentioned above but would not prevent invitation of nonmembers of the Society to participate in Section programs as guests of the Section.

Before acting on the repeal, the Council invited discussion of the proposal at the Society Affairs session of the Memphis meeting, October 15, 1956. Subsequently, the Council requested the Sections to conduct an opinion poll and report back.

Nineteen of the 21 sections reported as follows: 16 favored repeal of Bylaw 75; 2 were opposed to repeal, and one took no action. Of the 16 Sections favoring repeal, 8 recommended that current Associates be permitted to retain their section affiliation.

On a motion by Mr. Stone, seconded by Mr. Goddard, the Council voted unanimously to repeal Bylaw 75 with the understanding that those currently listed by the Sections as Associates may continue to be so recognized.

This action has no bearing whatever on the grade of Associate Member of the national Society. Associate Members of this category retain their regular status and all privileges of that grade.

Dues for Associate and Affiliate Members

The Constitution provides $6 per year dues for both Affiliate and Associate Members. This rate has applied since the time when the subscription price of the JOURNAL OF FORESTRY was also $6. The subscription price of the JOURNAL is now $7.50.

An Associate Member is a scientist (nonforester) working in a field closely allied to forestry, or a nonforester who has made an outstanding contribution to public or private forestry. Associate Membership is a terminal grade, and no advancement to voting grade is possible. There are currently 247 Associate Members.

Affiliate Members are (a) graduates of nonaccredited forestry schools who have completed the basic forestry courses, (b) persons who qualify for membership through a combination of education and practical forestry experience, and (c) graduates of accredited forestry schools who have majored in a curriculum which did not include all of the five basic professional forestry courses. Affiliate Members may upon proper qualifications be advanced to Junior Members, although a substantial proportion of the members in this grade remain as Affiliates permanently. There are now 710 Affiliate Members.

At the Council meeting held October 14, 1956, the Membership Committee of the Council recommended that dues for Associate Members be increased to $9 per year. This would cover the costs of the JOURNAL plus a reasonable charge for those membership services which are involved. The Membership Committee believes that there is no need to carry such members at dues which appear to be less than the average cost of handling, and that $9 per year is in no sense a hardship on men of the maturity and stature of Associate Members if they are firmly interested in the Society.

The Membership Committee also recommended to the Council that dues for Affiliate Members be changed from the present $6 per year level to $6 per year for the first three years of membership, $9 per year for the next three years, $12 per year thereafter. As a result Affiliate Members' dues would be in conformity with those of Junior Members and Members for men with an identical number of years of membership. At the same time an Affiliate who remains permanently in that grade would have his dues level off at $12 per year instead of the $15 level now paid by Members.

The Membership Committee believes that for those on the way to regular membership it is reasonable to have a dues pattern similar to that for Juniors and Members and that, for those remaining in the Affiliate grade, the proposed schedule is consistent with the maturity and economic status of the men involved.

At the request of the Council, the Sections were invited to conduct opinion polls on these proposals. Nineteen of the 21 Sections reported that a majority of the members approved the proposed increases in dues.

Accordingly, on a motion by Mr. Stone, seconded by Mr. Coulter, the Council unanimously decided to submit the recommended dues of $9 for Associate Members to the voting membership of the Society by letter ballot.

On a motion by Mr. Briegleb, seconded by Dr. Garratt, the Council unanimously decided to submit the recommended dues of $6, $9, and $12 for Affiliate Members to the voting

4 things you should demand when you buy tools and equipment!

AUGUST SPECIAL

A $90 Photo Interpretometer

for only

$19.95

BY a streak of good luck we have been able to buy a limited number of Austin Photo Interpretometers at a fantastically low figure—and while they last, we are offering these quality instruments, which list at $90, for the unbelievably low price of $19.95. Each, carrying Forestry Suppliers guarantee, is in perfect condition, complete with case and a handbook of instructions.

The Austin Photo Interpretometer is a combination instrument which, in effect, operates as a stereoscope, a height finder and a device for making linear photographic measurements. Its floating dot principle makes it exceptionally valuable for the forester and engineer as it permits determination of tree heights and contours on aerial photographs.

ACT TODAY—$19.95 WHILE THEY LAST!

1 **Full Dollar Value**—Your dollar is worth exactly what you get in return for it. With years of experience in supplying the forestry profession, Forestry Suppliers, Inc. is your best insurance of full value for every dollar you spend.

2 **Performance**—Like everything else, tools and equipment change. There is constant refinement. New equipment is devised. Forestry Suppliers keeps abreast of all new developments, assuring you maximum tool performance.

3 **Dependability**—You can depend upon Forestry Suppliers for the tool you want when you want it. An inventory of more than a thousand different items—the best obtainable in America and Europe—to choose from. See our Catalog No. 7.

4 **Quick, Direct Service**—Every order is a "Special" at Forestry Suppliers. Within minutes after your order is received, processing begins for immediate shipment. No order is too large—or too small—for quick, direct handling.

OUR booming forest economy whose credo is more wood for more people is demanding more tools and better tools—tools ranging from timber cruising devices that blueprint the job to the power equipment that gets it done. Forestry Suppliers, Inc., among the first to foresee this need, is playing a vital part in keeping American forestry, private and public, adequately tooled and equipped. That its volume of business has more than doubled since 1954 is eloquent testimony to the success of this role—as well as to forestry's widening horizons. From its beginning, the guiding principles of Forestry Suppliers have been (1) full value for every dollar you invest in equipment, (2) tools that give you maximum performance, (3) dependability and (4) prompt, direct service.

Phone—4-3565
Wire—1825 Terry Road
Write—P.O. Box 8305
Battlefield Station
Jackson 4, Mississippi

FORESTRY SUPPLIERS
INCORPORATED

NEW MOTOROLA T-POWER 2-WAY RADIO

Transistorized Power Supply for both receiver and 25-watt transmitter

Long Life Transistors Replace the Vibrator . . .
Reduce Maintenance and "Down-Time"

Already famous for the lowest maintenance and operating costs in the 2-way mobile radio field, Motorola mobile radio is an even better investment now—with the T-POWER unit. The vibrator is gone! . . . replaced by rugged long-life transistors. Gone, too, is the problem of frequent vibrator replacement. Here is a mobile radio with an all-electronic power supply.

New Mounting Flexibility with Plug-In Control Head
. . . Same Basic Unit can be Used for Front or Trunk Mounting

With the T-POWER radio, you are no longer restricted to one type of mounting. Install the complete radio, with drawer unit and plug-in control head, for under-dash mounting. For rear mounting the same basic drawer unit can be installed in the trunk and connected by cable to a dash-mounted control head. And—the same basic drawer unit can be interchanged with the equivalent Motorola Twin-V trunk mount radio models operated from a 12-volt negative ground source.

T-POWER radio is another example of Motorola's continuing leadership in the practical application of transistors in mobile radio. Other tested and proved transistorized products include the Dynamic Microphone and Power Voice Speaker.

Get all the facts.—Write now for literature with complete information.

MOTOROLA Communications & Electronics, Inc. · 4501 Augusta Blvd., Chicago 51, Illinois · A Subsidiary of Motorola Inc.

membership of the Society by letter ballot.

On a motion by Dr. Vaux, seconded by Mr. Heacox, the Council voted unanimously that the dues of Junior Members advanced from Affiliate Membership shall be based on the date of their election to the Affiliate grade.

Consolidation of Junior and Member Grades not Approved

At a meeting of the Council on October 14, 1956, a proposal was considered for the consolidation of the Junior Member and Member grades. The Council Committee on Membership recommended that the proposal be referred back to the Sections for discussion.

Reasons for and against consolidation were outlined in the January 1957 issue of the JOURNAL, pages 62 and 63.

Nineteen of the 21 Sections conducted opinion polls; 16 opposed consolidation, 2 favored consolidation, and 1 Section had no clear-cut opinion. Of the 16 opposed to consolidation, nearly all recommended that action should be taken to strengthen the distinction between the two grades.

On a motion by Dr. Goddard, seconded by Mr. Fontanna, the Council voted unanimously to take no action on the proposed consolidation of the Junior Member and Member grades.

Study of Membership Grades

The following resolution, presented by Dr. Vaux, seconded by Mr. Heacox, was unanimously approved.

"The Council has taken cognizance of the strong desire, both within the membership and within the Council, to see a structure and designation of membership grades which clearly recognize varying degrees of professional standing. It is also apparent that the problems involved require careful and deliberate consideration if these objectives are to be achieved.

"Accordingly, the President is requested to appoint a Committee to study the requirements for advancement to the grades of Member and Junior Member, and the most effective methods of administering such advancements in order to maintain the grade distinctions as defined in the Constitution."

President Nelson has requested the following members to serve on this Committee: E. F. Heacox, chairman; Myron Krueger, and R. H. Westveld.

Membership Information

Mr. Heacox and Dr. Illick suggested that the Society's executive office make an analysis of the age-groups of members. This will be done during the coming months.

In addition, on motion by Mr. Heacox, seconded by Mr. Stone, the executive secretary was instructed to invite each member, on approaching his retirement age, to write a biography of his education and experience. Such biographies, filed with the members' personnel records in the Society's office, will have historical value. Photographs also are desired.

SAF Policy Statement on New Forestry Schools

At a meeting of the Council in December 1946, the members adopted a resolution concerning new schools of forestry. This policy statement was reaffirmed by the Council in 1949.

In order to bring the policy up to date, it was reviewed by a special Committee consisting of Dr. Garratt, chairman, Dr. Illick, and Mr. Goddard. On a motion by Dr. Garratt, seconded by Mr. Briegleb, the Council unanimously adopted the following revised policy.

"Because of the tendency of certain universities and colleges to offer instruction in forestry on the professional level without being fully qualified for the purpose; and because the 37 existing schools offering professional forestry, including the 27 which are currently accredited by the Society of American Foresters, are deemed sufficient to train the foresters needed in the foreseeable future, the Council authorizes the following statement on proposed new schools of forestry.

" 'In view of the capacity of existing schools of forestry in the United States to supply the demand for professional foresters, the Council of the Society of American Foresters recommends against the establishment of new schools or departments for professional training in forestry, unless there is a need not adequately met by the existing schools and unless such new schools or departments are effectively staffed, properly financed, and possessed of adequate facilities for professional education.

" 'The Society welcomes the intro-

Standards of Excellence

. . . AERMOTOR OBSERVATION TOWERS

Across our nation, thousands of Aermotor Observation Towers stand silent watch—aiding in the struggle to guard our forests and woodlands.

Their records show years of faithful service—in crippling snowstorms—driving rains.

Aermotor is proud of this record . . . proud to know that—

"In Observation Towers, the Standard of Excellence is Aermotor."

AERMOTOR COMPANY
2500 W. Roosevelt Road Chicago 8, Illinois

WANTED AT ONCE
Offer for S.A.F. Journals from 1929 to 1956
V. M. BEARER
Ligonier, Pennsylvania

PACIFIC WEATHER SERVICE
WEATHER: Forecasts—Warnings—Modification.
Fire Danger Rating—Instruments
J. B. "Ben" Melin, Meteorologist
2806 32nd Ave., So., Seattle 44, Wash.

SILVA COMPASS
Simpler — More Accurate
Recommended by foresters for cruising. Easier to use, faster, positive. Direct course readings. *Write for free literature and instructions.*
SILVA, INC., Dept. J, La Porte, Ind.

FOREST SEEDS
of CALIFORNIA
Since 1952
R. S. ADAMS A. P. BAAL
P.O. BOX 561
DAVIS ——— CALIFORNIA

25 MILLION SEEDLINGS
McCURDY BROS. NURSERIES
MANTON, MICHIGAN

Twenty-Sixth
PANAMA
Anniversary

- **B. B. Fan Drive Pumps**
- **B. B. Slip-on Units**
  Pump and Engine
- **Slip-on Units Complete**
  Pump, Engine, Tank, Completing Materials, All on Steel Skids
- **Compensating By-passes**
- **High Pressure Hose**
- **Pistol Grip Cut-offs**
- **Combination nozzles**
- **Vacuum Lift Systems**
- **Automatic Float Valves**
- **Tree Marking Guns**
  Pressure Type
- **Pyramid Drip Torches**
  With Preheating Burner
- **Flame Guns**
- **Angle Gauges**
  For Estimating Basal Area

Write For Free Catalog
PANAMA PUMP CO.
P.O. Box 689
Hattiesburg, Mississippi

duction of nonprofessional courses in forestry in colleges and universities as a matter of general education.

"'Forestry graduates of institutions which do not meet the standards of professional training set by the Society of American Foresters are not accepted by the profession as members of the Society on the same basis as are the graduates of approved schools, and accordingly may be handicapped in securing professional recognition.'"

Michigan College of Mining and Technology Accredited

In 1956 the Michigan College of Mining and Technology requested the Society's Committee for the Advancement of Forestry Education to make an examination of the Department of Forestry, for the purpose of accreditation if the forestry program should be found to meet the Society's standards.

After the Committee (Harold G. Wilm, chairman) reviewed the questionnaire forms supplied by the College, the institution was visited by Henry Clepper, A. L. McComb of Iowa State College, and John R. Emens, president of Ball State Teachers College in Indiana, who functioned as a generalist on the visiting committee.

On the basis of the questionnaire form and the report of the visiting committee, the Committee for the Advancement of Forestry Education unanimously recommended that the College be accredited.

In accordance with this recommendation, on a motion by Mr. Stone, seconded by Dr. Illick, the Council voted unanimously to accord to Michigan College of Mining and Technology accredited status for professional instruction in forestry.

On motion by Dr. Garratt, seconded by Mr. Heacox, this action was made retroactive to May 15, 1954 for graduates not yet Junior Members of the Society. In short, forestry graduates of the College since May 15, 1954 are eligible to enter the Society as Junior Members. Graduates during this period who are still Affiliate Members are automatically eligible for advancement to the Junior grade.

Authorization of Division of Private Forestry and Division of Public Relations Rescinded

Article XII of the Constitution provides for authorization by the Council of subject Divisions of the Society. Bylaw 80 states that "The purpose of subject Divisions shall be to provide an effective means of considering various phases of forestry, supplementary to that provided through Society or Section committees, and not to create vocational groups within the Society."

Because the Division of Private Forestry has tended to create a vocational group within the Society, as would be the case if there were divisions of federal forestry, state forestry, or farm forestry, a number of members including some in private forestry have advocated that it be discontinued.

On a motion by Mr. Heacox, seconded by Mr. Allen, the Council voted unanimously to rescind the authorization of the Division of Private Forestry, effective December 31, 1957, on the ground that it is not a subject Division.

Since public relations activities apply to all Divisions and Sections of the Society, the Council discussed the advantages of discontinuing the Division of Public Relations as a subject Division. On motion by Mr. Coulter, seconded by Mr. Heacox, the authorization of the Division of Public Relations was unanimously rescinded by the Council, effective December 31, 1957.

Rootspred Tree Planters

Standard: Heavy duty planter for tractors with hydraulic lift. Usable on 20 h.p. and up wheel tractors — also on the smaller crawlers. Makes these sites plantable: heavy sod, stony soils, steep hillsides, brushy sites. Equipped with 20" coulter.

M-55: A low cost planter for the easier sites where no hillside adjustment is necessary. At $245 this is ideal for the small Christmas tree grower. Wearing parts same as the "Standard."

Literature sent on request. *Write* ROOTSPRED TREE PLANTER at ST. PETERSBURG, PENNSYLVANIA.

Both these Divisions will hold scheduled meetings at Syracuse in November, but will not hold meetings thereafter.

Chapter Bylaws

The following communique was unanimously approved by the Council, on motion by Mr. Goddard, seconded by Mr. Briegleb. The statement is self-explanatory, and by its publication herewith constitutes due notice to the membership as provided in the Constitution.

June 28, 1957
Communique to: The Sections and Chapters
From: The Council
Subject: Chapter Bylaws

Bylaw 79, authorizing the formation of Chapters of the Sections, was adopted by the Council in June 1949. Open meetings of the Chapters were specifically authorized.

In addition, a suggested form of bylaws for the Chapters was prepared. These suggested bylaws made it permissive to elect Associate members of the Chapters who are not members of the Society. The purpose was to promote closer association between members of the Society and local persons interested in forestry activities.

Bylaw 79 provides that "Actions or recommendations of a Chapter on Society matters will be transmitted to the Council with the recommendation of the Section." When Bylaw 79 was adopted, it was further intended, though not specifically stated, that any action of a Chapter having to do with legislative or policy matters would be channeled through the Section.

In recent years some Chapters have issued public statements on matters affecting the profession and forestry policy. The public is in no position to distinguish between Chapter

members who are bonafide members of the Society and Chapter associates who are not members of the Society. In one recent instance, such an action taken by a certain Chapter and released to the press could have resulted in considerable embarrassment to the Section and to the professional foresters within the state concerned.

Accordingly, the Chapters are herewith requested to discontinue the practice of electing Chapter associate members. A revised set of proposed Chapter bylaws are enclosed. Each Chapter having bylaws is asked to amend its bylaws to conform to these. Open meetings to which nonmembers may be invited to attend and participate are still authorized and encouraged.

SUGGESTED BYLAWS FOR THE ..... CHAPTER OF THE ..... SECTION OF THE SOCIETY OF AMERICAN FORESTERS

Article I, Name.

The name of this organization shall be .....Chapter of the.....Section of the Society of American Foresters.

Article II, Objects.

The objects of this Chapter shall be to promote the interests and standards of the profession of forestry, to promote the practice of forestry, to afford opportunities for foresters to become better informed about local forestry matters, and to provide for professional solidarity and fellowship among the members.

Article III, Membership.

Section I. The membership of the ..... Chapter shall consist of all grades of members of the Society of American Foresters.

Section II. Members eligible to vote will be Junior Members, Members, and Fellows.

Section III. Membership in the ..... Chapter will be limited to residents of (define the area or state).

Article IV, Officers.

Section I. The officers of this Chapter shall be a Chairman, a Vice Chairman, and Secretary-Treasurer who with the immediate past Chairman and the chairman of the Membership Committee will comprise the Executive Committee, which has the power to act for the Chapter on urgent matters.

Section II. Officers of the Chapter will be elected by a plurality vote of the voting members to serve for one year following election, concurrently with the Section officers.

Section III. Duties of the chairman will be to appoint and counsel needed committees, to preside at meetings, and to direct the activities of the Chapter. Duties of the Vice Chairman will be to assume the duties of Chairman when necessary and to serve as active chairman of the Program Committee. Duties of the Secretary-Treasurer will be to maintain financial records and to report the activities of the Chapter to Chapter members and to the ..... Section. He will also maintain a current roll of Chapter membership, and perform other duties usually assigned to such an officer.

Article V, Finances.

No dues shall be charged. Assessments not to exceed $1 per year may be voted by a two-thirds majority of those voting, by letter ballot or at a regularly announced meeting, to carry out projects of the Chapter.

Article VI, Meetings.

Section I. Not less than one meeting per year shall be scheduled by the Executive Committee.

Section II. Meetings will be so scheduled as not to conflict with Section meetings.

Section III. Ten members, including at least one member of the Executive Committee, shall constitute a quorum.

Article VII, Power of Petition.

A petition signed by at least 15 voting members will make a letter ballot of the voting membership mandatory, a two-thirds majority of those voting being sufficient to remove an officer from office for inadequate performance of duty, to schedule a meeting, or to arrive at a decision on any other matter upon which action has not been initiated by the Executive Committee or in a regular meeting.

Article VIII, Amendments.

Amendments or additions to these bylaws require a two-thirds letter ballot majority of those voting. All members must be provided with ballots 30 days before votes are to be counted.

1957 Annual Meeting

The program and arrangements for the 1957 annual meeting are published elsewhere in this issue. The dates are November 10-13. The city is Syracuse, N. Y., and the headquarters, the Syracuse Hotel.

1958 Annual Meeting

The 1958 annual meeting will be held in Salt Lake City, September 28-October 1. Headquarters will be the Hotel Utah.

Committee chairmen were designated by the Council on motion by Mr. Briegleb, seconded by Mr. Heacox, as follows:

General Chairman, Reed W. Bailey; Co-chairman, Floyd Iverson.

Chairman of Committee on Arrangements, F. C. Koziol.

1959 Annual Meeting

The 1959 annual meeting will be held in San Francisco, November 15-18. Headquarters will be the Sheraton-Palace Hotel.

Committee chairmen were designated by the Council, on motion by Mr. Heacox, seconded by Mr. Briegleb, as follows:

Binders For Journal of Forestry

Holds 12 issues of Journal

Brown imitation leather—stiff board—square corners lined.

Title *Journal of Forestry* stamped in gold foil on front cover and backbone.

Price $2, postpaid.

Order today

SOCIETYOF AMERICAN FORESTERS
Mills Building, Washington 6, D. C.

NEW SOCIETY PUBLICATION AVAILABLE

Forest Practices Developments in the United States, 1940-1955

Report of the Committee of Forest Practices, Division of Silviculture, Society of American Foresters, Kenneth P. Davis, *Chairman.*
The report is in three parts: (1) highlights of major developments affecting forest practices during 1940-1955, (2) digest and summary of present state legislation on cutting practices, and (3) annotated bibliography with a key to 1940-1955 literature.

Price $1

SOCIETY OF AMERICAN FORESTERS
MILLS BUILDING WASHINGTON 6, D. C.

SAFEST, SIMPLEST DRIP TORCH YOU CAN USE

FORESTER
Seal-Tite Torch

Provided with fuel trap, check valve and flash-back screen to protect you from explosion hazards.

Welded tank with cushion base, double bottom, oil proof gaskets and tight valves SEALTITE against leakage.

No Pressure—No Preheating. Burns diesel oil, stove oil or mixed fuels with low flash-point.

Approved for use by U. S. Forest Service

Manufactured By

WESTERN FIRE EQUIPMENT CO.
69 Main St. San Francisco, California

schultz
DESIGNERS · ENGINEERS · MANAGERS · SURVEYORS · FORESTERS · APPRAISERS

WORLD WIDE
FOREST SERVICES

- FOREST INVENTORIES
- LOGGING PLANS
- TIMBER MANAGEMENT
- MILL DESIGNS
- PROTECTION PLANS
- WOOD SUPPLY AUDITS

Professional, Technical and Consulting Services

C. D. Schultz & Company
Incorporated

White-Henry-Stuart Building
Seattle, Washington

General Chairman, John Callaghan.

Program Chairman, R. Keith Arnold.

Chairman of Committee on Arrangements, Burnett H. Payne.

1960 Annual Meeting

The sixtieth anniversary meeting of the Society will be held in Washington, D. C., November 13-16, 1960. Headquarters will be the Sheraton-Park Hotel.

On motion by Mr. Goddard, seconded by Mr. Stone, Henry Clepper, executive secretary, and Arthur Meyer, editor, were authorized by the Council to proceed with the compilation of a book to be published during the sixtieth anniversary year. The tentative title is *American Forestry, the First Sixty Years.*

Committees for this meeting will be announced later.

1961 Annual Meeting

In 1961 the Society of American Foresters will hold its meeting jointly with the Canadian Institute of Foresters. Minneapolis has been selected as the city, and the date will be in October.

Details concerning the program and arrangements for this meeting will be announced later.

Anonymous Memorial Award

At the Council meeting held February 19-21, 1956, a committee was appointed to make nominations for the Memorial Award for outstanding research in the biological sciences. The members of the committee are S. G. Fontanna, chairman, P. A. Briegleb, and E. F. Heacox. (For details concerning the award, refer to the JOURNAL for April 1956, pages 280-281.)

On motion by Mr. Coulter, seconded by Mr. Heacox, the Council voted unanimously to make two awards at the Society annual dinner in Syracuse, on November 13, 1957.

The names of the recipients will not be announced until the date of the dinner. The awards will consist of cash payments and plaques.

The first awards from this fund were made at the Society annual dinner at Memphis last October 16. The recipients were Leo A. Isaac and Philip C. Wakeley.

Commercial Forestry Companies

On at least two occasions, members of the Society, acting through local Sections and Chapters, have set up corporations for the purpose of acquiring and operating forest properties commercially. SAF members have been invited to invest in these corporations through the purchase of stock.

The Council of the Society, believing in the free enterprise system, approves of professional foresters participating in the ownership and management of forest lands. However, on legal advice, the Council asks that forestry companies and corporations scrupulously avoid using the name of the Society or any of its Sections in the promotion and sale of stock in such enterprises.

On motion by Mr. Stone, seconded by Mr. Goddard, the Council unanimously voted to go on record as opposed to the use of the Society's name in the promotion and sale of stock in any business enterprise.

Forest Soils Manual

A Committee on Forest Soils has been active for several years in the Columbia River and Puget Sound Sections. A report, in the form of a book-length manual, has been compiled with the tentative title *Forest Soils Manual of the Douglas-fir Region.*

Although the committee still has some work to do on the report, Mr. Stone proposed that the manual might be suitable for publication by the Society. On motion by Mr. Goddard, seconded by Mr. Fontanna, the Council authorized the editorial staff of the Society to explore the possibility of publishing the manual when completed.

THE RIGHT SAW FOR EVERY JOB

NO. 27 TREE EXPERT'S SAW
26-in. blade, 6 points per inch, beveled forward. Most popular arborists saw made. $9.25. With 28-in. blade (No. 28) $9.95 delivered in U.S.A.

NO. 41 UTILITY SAW
Especially designed for large cuts. Tuttle tooth blade in 20 and 24-in. lengths. Extra large handle. $6.95 and $8.95 delivered in U.S.A.

NO. 114 RAPID CUT
Faster cutting than any other style. Diamond-point teeth with well shaped raker. Extra large grip permits wearing gloves. 26-in. blade. $9.20 delivered in U.S.A.

SAW SHEATHS
Saw sheaths for all Bartlett saws. Protect saw and worker. Made of 8 oz. oak tanned leather.

Ask About Bartlett Tree Paint

Write for Catalog No. 37 showing all tools and supplies.

BARTLETT MFG. CO.
3015 E. Grand Blvd. Detroit 2, Michigan

Assistant Treasurer

For many years Miss L. A. Warren, business manager, has functioned as assistant treasurer of the Society. Under the Constitution, the executive secretary performs the duties of treasurer. In order to formalize the procedure under which Miss Warren has functioned, the Council unanimously approved the following policy on motion by Mr. Goddard, seconded by Mr. Fontanna.

"In the absence of the Treasurer or in his inability to act, his duties, as provided under Article VI, Section 5, may be performed by Miss L. A. Warren, as an officer of the Society of American Foresters with the title of Assistant Treasurer, until such time as this authorization is rescinded."

Miss Warren and Mr. Clepper are each bonded in the amount of $50,000. All other employees are bonded for $10,000 each.

Employment of F. H. Eyre

F. H. Eyre of Arlington, Va., recently retired from the U. S. Forest Service's Washington office as chief of the Division of Forest Management Research, has joined the staff of the Society's executive office. Working on a half-time basis he will assist in the publication of *Forest Science*, and in the revision of the book *Forestry Terminology*.

Mr. Eyre's employment was unanimously approved by the Council, on motion by Dr. Garratt, seconded by Mr. Goddard.

SAF Personnel

Prior to the Council meeting, President Nelson requested that Mr. Allen and Mr. Stone, comprising a committee of two, make an analysis of Society finances with a view to recommending cost-of-living and meritorious salary increases to the personnel of the executive office.

On motion by Mr. Heacox, seconded by Mr. Stone, the Council unanimously authoribed salary adjustments in accordance with a formula proposed by the committee.

Membership Applications and Advancements

Proposals for admission, advancement, and reinstatements received in the Society office during the month of June are listed below.

Action on the eligibility of those proposed for membership as listed below will be taken by the Council as of September 1, 1957. Communications from voting members regarding the membership eligibility of these persons should be received in the Society office prior to that date.

Allegheny Section

Junior Grade

Pyle, R. M., Mgr., Forestry Engineering, Clarion, Pa.; Pa. State, B.S.F., 1950.

Students Eligible for Automatic Advancement

WEST VIRGINIA UNIVERSITY

Garrett, W. T.	Peters, G. J.
Inks, D. F.	Reed, R. T.
Leichter, W. B.	Shultz, D. R.
McQuown, R. C.	Webb, E. L.
Pawlowski, R. T.	York, B. W.

Member Grade

Cumming, J. A., Asst. Forester, Dept. Cons. & Econ. Div., Trenton, N. J.; State Univ. of N. Y., B.S.F., 1949. (Junior 1951).

Lavin, J. J., USFS, St. Anthony, Idaho. (Junior 1950).

Lindahl, R. R., Forester, USFS, Clifton Heights, Pa.; Pa. State, B.S.F., 1950; Yale, M.F., 1951. (Junior 1951).

Appalachian Section

Junior Grade

Beyea, L. J., Forester, USFS, Marion, Va.; State Univ. of N. Y. College of Forestry, B.S.F., 1953.

Gearhart, P. H., Forester, USFS, Marion, Va.; Pa. State, B.S.F., 1953.

Mocha, J. E., Forester, W. Va. Pulp & Paper Co., Walterboro, S. C.; VPI, B.S., (Forestry), 1955, Univ. of Fla., M.S.F., 1957.

Member Grade

Haney, G. P., Research Forester, USFS, Union, S. C.; Pa. State, B.S.F., 1951; N. C. State, M.F., 1956. (Junior 1951).

Affiliate Grade

McCaskill, W. D., Community Forester, W. Va. Pulp & Paper Co., Camden, S. C.

Morrison, H. S., Pulpwood Yard Mgr., W. Va. Pulp & Paper Co., Walterboro, S. C.

Central Rocky Mountain Section

Member Grade

Ince, G. A., Staff Asst., USFS, Colo. Springs, Colo.; Colo. State Univ., B.S.F., 1950; Duke, M.F., 1951. (Junior 1951).

Central States Section

Junior Grade

Students Eligible for Automatic Advancement

SANDVIK
No. 1
BUSH AXE
WITH REPLACEABLE BLADE
SAFER, FASTER, EASIER
. . . than an Axe for brush and saplings!

The thin, flat, keen-edged blade slices easily through young, resilient stems. Balance and weight for use with one hand. Protected blade cuts closer to ground. Circular and Forester's Tool Catalog is yours on request.

Write Dept. J.

Sandvik STEEL INC.
SAW & TOOL DIVISION
1702 NEVINS ROAD, FAIR LAWN, N. J.

LUFKIN
Measuring Tools designed for the Lumber Industry

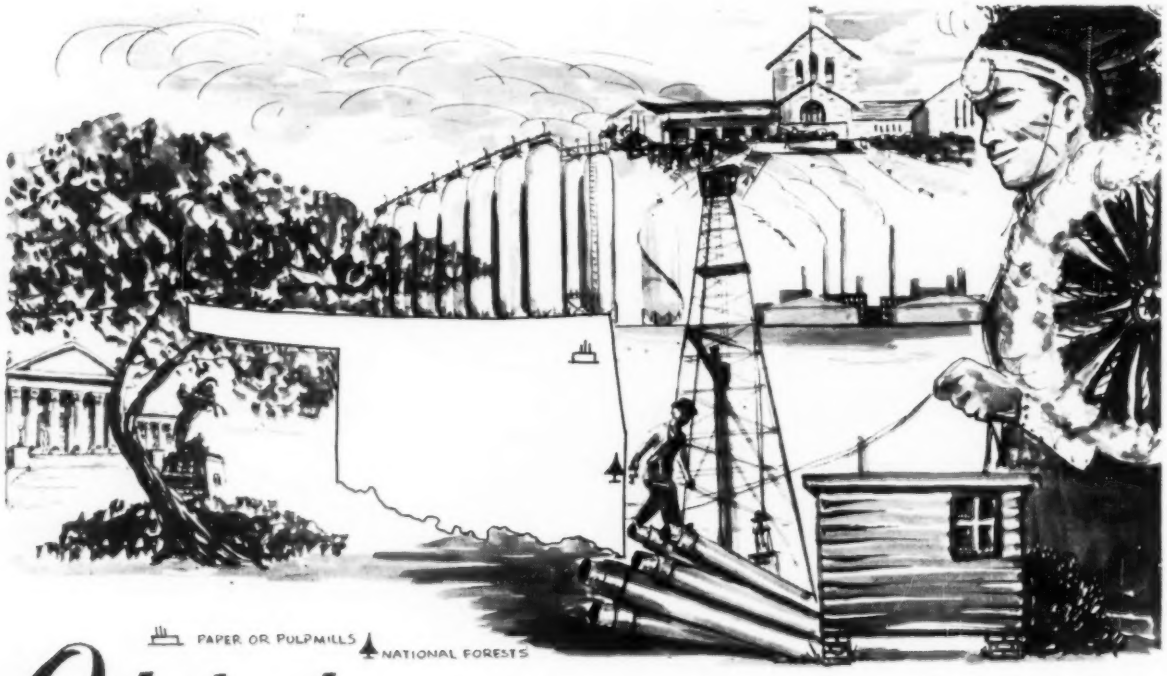
For nearly a century, the lumber industry has used Lufkin measuring devices. Through the years, Lufkin has pioneered the development of better, longer lasting tools for accurate measurement and estimating.

BOARD RULES
LOG RULES
COMBINATION BOARD & LOG RULES
LOG CALIPERS
TREE TAPES
CRUISER STICKS
STEEL TAPES

FREE BOOKLET 415

THE LUFKIN RULE CO., Saginaw, Michigan
Please send your free 12-page booklet on measuring tools for the lumber industry.
NAME_____
ADDRESS_____
CITY_____ STATE_____

No. 34 of a series featuring forestry practices, projects and products . . .



Oklahoma

Oklahoma, with elevations ranging from 350 ft. to 4978 ft. above sea level and with annual rainfall varying from 15 in. to 50 in. in the east, is a state of geographical contrasts.

Probably as a result of this, at least 141 species of trees are native to the state—a variety greater than that in all Europe! Though outsiders often considered this a prairie state, Oklahoma has 16 counties where 63% of the land area is forested; 32 counties with 24% forested; the additional 29 counties, 3% forested.

Sawmills operate in 44 Oklahoma counties. Woodusing industries products annually are valued at more than $55,000,000. And, of equal importance in such geographic variation is the forests' function as shelterbelts, windbreaks, wildlife habitat and protection of watersheds.

Forestry became a state government function in 1925 and, in 1937, became a division of Oklahoma Planning and Resources Board.

Fire control is a chief responsibility of the division, which protects more than 3,145,000 acres of land in eastern Oklahoma. This area has more than doubled in the past ten years. Present services require 16 fire towers, 400 miles of telephone lines and hundreds of miles of truck trails. An average of 862 fires are put out annually.

In addition, the division cooperated with volunteer units protecting 400,000 acres.

Within the educational and assistance phase of Oklahoma's forestry program is the state seedling program. Two state nurseries provide seedling forest trees for farmers and timberland owners for reforesting, port lot plantings, shelterbelts and windbreaks and wildlife habitat improvement. One nursery grows only pine, while the second, providing for divergent climatic conditions, supplies at least 15 varieties. Throughout the state, areas vocational agricultural groups, 4-H clubs and individuals help in seed collections.

Since the shelterbelt program was launched in 1935, more than 35 million trees have been planted for windbreaks on Oklahoma farms. Farm foresters assist in these and post lot planting, as well as management of native woodlands.

Another part of the educational program is the weekly radio round table discussion of forestry problems, a public service program that has been carried on by the Forestry Division since 1941.

DONALD E. STAUFFER, DIRECTOR, DIVISION OF FORESTRY, OKLAHOMA PLANNING AND RESOURCES BOARD—*contribution to this series does not necessarily constitute endorsement of* SOUTHERN GLO *products.*

It is well known among paint users and manufacturers alike that colors react differently to weathering. Thus, in the SOUTHERN GLO line of tree marking paints that include Bright (Seeing) Red, Yellow, Orange, Blue, White and Aluminum, each color is produced by the individual formula that continuing field and laboratory tests indicate will give best visibility and endurance.

Based on the famous stay mixed formula #71020 and produced only in Southern Coatings' plants, all SOUTHERN GLO forestry paints are consistent in quality, order after order.

SOUTHERN COATINGS AND CHEMICAL CO. Dept. 2, Sumter, South Carolina—New Orleans, La.

PURDUE UNIVERSITY

Balka, B. C.	Mitchell, W. R.
Bruggenschmidt, J. G.	Moser, J. G.
Cooper, R. A.	Osterhage, L. J.
Hartke, M. E.	Petty, M. W.
Heinmann, L. J.	Reyburn, J. H.
Hornsby, R. L.	Rich, J. L.
Hosea, W. H.	Selby, K. C.
Hovarter, F. M.	Spangler, J. H.
Jones, T. A.	Vogel, M. A.
Kerr, R. L.	Weikert, G. D.

Member Grade

Soine, G., Farm Forester, Ohio Div. of Forestry, Cambridge, Ohio; Mich. State, B.S.F., 1938. (Junior 1953).

Columbia River Section

Student Grade

OREGON STATE COLLEGE

Fehly, R. E.	Wright, W. H.

Junior Grade

Students Eligible for Automatic Advancement

OREGON STATE COLLEGE

Ballew, L. E.	Liddicoatt, G. W.
Blaser, L. A.	Marshall, M. E.
Bowden, D. L.	Morrison, L. D.
Cavallin, J. E.	Mulkey, L. V.
Clayton, J. M.	Peel, D. L.
Evans, K. L.	Peterson, D. M.
Gehrke, F. E.	Reed, J. H.
Geiger, P. H.	St. Clair, F. W.
Gossett, L. S.	Scheuner, W. H.
Greenup, M.	Schmitz, R. F.
Hamilton, C. W.	Scroggins, D. L.
Hanson, D. C.	Torkelson, F.
Harsey, W. W.	Trail, L. D.
Holdgrater, G. N.	Tutt, R. C.
Johnston, J. T.	Wade, L. R.
Kinkead, R. R.	Wenger, W. D.
Koten, D. E.	Wittwer, H. J.

Woodard, L. L.

Member Grade

Bosselman, H. H., Forester, Bur. of Land Mgmt., Coos Bay, Ore.; Pa. State, B.S.F., 1951; Ore. State, M.F., 1955. (Junior 1951).

Brown, D. J., Foreman, Young Logging Co., Roseburg, Ore.; Ore. State, B.S.F., 1953. (Junior 1953).

Ellingsen, T. S., Forester, Port Orford Plywood Corp., Port Orford, Ore.; Ore. State, B.S.F., 1950. (Junior 1953).

Jennings, W., Dist. Forester, Weyerhaeuser Tbr. Co.; Ore. State, B.S.F., 1950. (Junior 1951).

McKee, C. A., Forester, USFS, John Day, Ore.; State Univ. of N. Y., B.S.F., 1952. (Junior 1952).

Prigge, A. A., Forester, USFS, Prospect, Ore.; Univ. of Minn. B.S.F., 1952. (Junior 1952).

Thomas, V. D., Forester, H. G. Chickering, Eugene, Ore.; Ore. State, B.S.F., 1952. (Junior 1953).

Gulf States Section

Junior Grade

Miller, R. L., Asst. Silviculturist, Texas Forest Service, College Sta., Texas; Okla. A&M, B.S., (Forestry), 1953. (Affiliate 1954).

Students Eligible for Automatic Advancement

LOUISIANA POLYTECHNIC INSTITUTE

Boyd, W. L.	Simmons, B. J.
Holmes, J. L.	Todd, C. M.
Joiner, W. T.	Trigg, N.
Mathys, E. G.	Wootten, G. H.

LOUISIANA STATE UNIVERSITY

Asseff, R. E.	Holland, P. G.
Box, B. H.	Lizana, H. P.
Brinkman, G. L.	Lyon, J. F.
Crocker, G. R.	Rosenstreter, G. C.
Elliott, H. E.	Schwartz, M. M.
Guillory, G. R.	Sellars, C. H.
Hamner, J. G.	Smith, W. J.
Hecker, G. C.	Watkins, J. T.

Member Grade

Haas, R. E., Forester, Southland Paper Mill, Lufkin, Texas; Iowa State, B.S.F., 1951. (Junior 1951).

Holland, J. J., Field Asst., Int. Paper Co., Natchez, Miss.; LSU, B.S.F., 1952. (Junior 1952).

Kemp, A. K., Head, Dept. of Forestry, Stephen F. Austin State College, Nacogdoches, Texas; Univ. of Ga., B.S.F., 1948; Duke, M.F., 1949; Univ. of Minn., Ph.D., 1957. (Junior 1955).

Krouse, P. F., Reg. Forester, Kirby Lbr. Corp., Merryville, La.; LSU, B.S.F., 1950. (Junior 1952).

Rinehart, D. E., Forestry Agent, Ill. Central R. R., Hattiesburg, Miss.; Purdue, B.S.F., 1951. (Junior 1951).

Smith, E. A., Dist. Ranger, USFS, Gloster, Miss.; Mich. State, B.S.F., 1950. (Junior 1951).

Sundin, P. S., Dist. Forester, Int. Paper Co., Jefferson, Texas; Univ. of Minn., B.S.F., 1951. (Junior 1951).

Todd, W. J., Dist. Forester, Kirby Lbr. Corp.; Univ. of Mo., B.S.F., 1950. (Junior 1951).

Tucker, G. L., Forester, Koppers Co. Inc., Petal, Miss.; Univ. of Ga., B.S.F., 1952. (Junior 1952).

Affiliate Grade

Harris, J. N., Area Forester, Crown Zellerbach Corp., Harrisville, Miss.

Inland Empire Section

Student Grade

UNIVERSITY OF IDAHO

Hodgins, J. R.	Zwirtz, R. J.

Intermountain Section

Junior Grade

Students Eligible for Automatic Advancement

UTAH STATE UNIVERSITY

Bowman, K. J.	Shearer, R. C.
Hooper, J. F.	Warren, S. E.

Member Grade

Hart, W. J., Deputy State Forester, Utah Board of Forestry, Salt Lake City, Utah; Utah State Univ., B.S.F., 1952. (Junior 1952).

Moran, W., Forester, USFS, Ogden, Utah. Reinstatement.

Kentucky-Tennessee Section

Affiliate Grade

Dyer, D. M., Asst. Woods Mgr., Hiwassee Land Co., Calhoun, Tenn.; Univ. of Toronto, B.S., (Forestry), 1936.

New England Section

Student Grade

UNIVERSITY OF MAINE

Johnson, A. M.

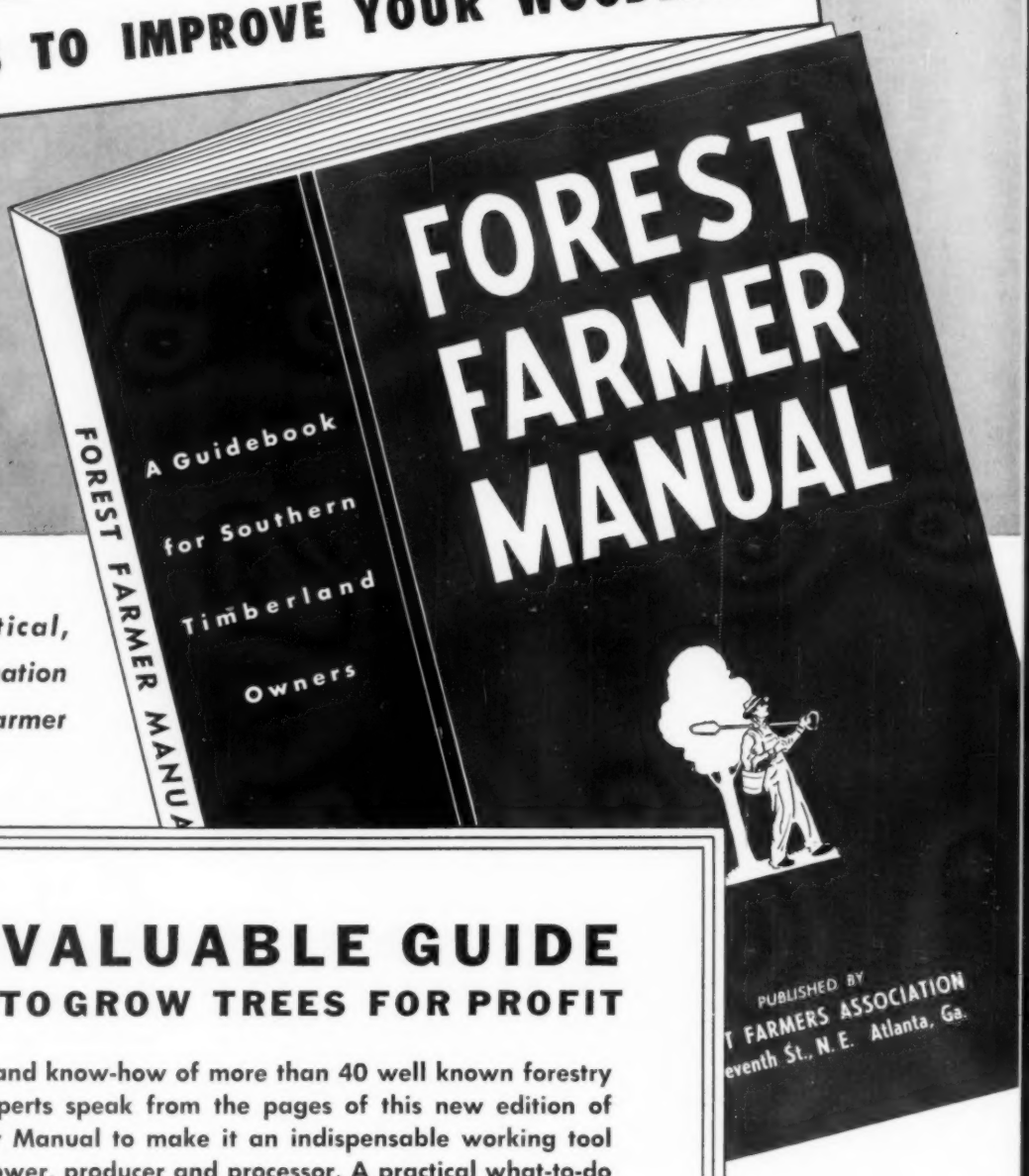
SECOND
IMPROVED
PRINTING
FOREST MENSURATION
by
H. ARTHUR MEYER, PH.D.
FUNDAMENTALS FOR STUDENT
EVERYDAY APPLICATIONS
FOR THE FORESTER
AND MANAGER
COMPLETE COMPUTATIONAL
PROCEDURES FROM FIELD DATA
TO FINAL RESULT
357 PAGES $6.50 POSTPAID
The first printing of the book was reviewed in the February 1954 issue of the Journal of Forestry.
Order from
MRS. H. ARTHUR MEYER
404 S. PATTERSON STREET
STATE COLLEGE, PA.

TREES FOR FOREST PLANTING
PINE•SPRUCE
We have grown Pine, Spruce and other conifers for 50 years.
KEENE FORESTRY ASSOCIATION
BOX 378, KEENE, NEW HAMPSHIRE

BAKED ENAMEL
METAL FORESTRY SIGNS
for WOODLAND BOUNDARY MARKERS—NO TRESPASSING & FIRE WARNING SIGNS—LOCATION MARKERS—CRUISER TAGS—etc., any size to your specifications. WRITE FOR QUOTATIONS ON ALL YOUR SIGN NEEDS, state size and quantity.
A. L. LIND COMPANY
5036 THOMAS AVENUE SOUTH
MINNEAPOLIS 10, MINNESOTA

CHRISTMAS TREE
SEEDLINGS
PLANT A CROP WITH A FUTURE!
Growing Christmas trees beautify idle land, earn satisfaction and profits. We offer a wide variety of seedlings and transplants.
Write today for Price List and Planting Guide.
PAINT CREEK NURSERIES
R. D. 1 SHIPPENVILLE, PA.

1001 WAYS TO IMPROVE YOUR WOODLAND



A treasury of practical, down-to-earth information for the Southern tree farmer

AN INVALUABLE GUIDE
ON HOW TO GROW TREES FOR PROFIT

The experience and know-how of more than 40 well known forestry and timber experts speak from the pages of this new edition of the Forest Farmer Manual to make it an indispensable working tool for the timber grower, producer and processor. A practical what-to-do and how-to-do guidebook, you will find on every page authoritative answers to questions that arise day in and day out in the woodlands of the South—questions on management practices, fire protection, insects and disease, planting methods, harvesting, marketing, tools and equipment, forest laws, taxation, etc. Don't guess when you can consult the experts for little more than 1¢ a day.

$4.00 a copy—Order today from

THE FOREST FARMERS ASSOCIATION
P. O. Box 7284, Station C • Atlanta, Georgia

FULLY ILLUSTRATED

PRICE $4.00

Junior Grade

Pidacks, R. W., Forester, Oxford Paper Co., Rumford, Maine; Univ. of Maine, B.S.F., 1951.

Students Eligible for Automatic Advancement

UNIVERSITY OF MAINE

Bassett, K. H.	Jackson, W. L.
Brown, R. B.	Payne, F. J.
Crockett, R. V.	Sanborn, R. M.
Culver, D. H.	Standerwick, J. T.
Fitzgerald, R. O.	Whitham, L. C.

Member Grade

Hodsdon, K. Y., Dist. Forester, Penobscot Development Co., Great Works, Maine; Univ. of Maine, B.S.F., 1950. (Junior 1951).

New York Section

Junior Grade

Thompson, R. C., Forester, National Lead Co., Tahawus, N. Y.; State Univ. of N. Y., B.S.F., 1951; M.S., (Education), 1952.

Students Eligible for Automatic Advancement

STATE UNIVERSITY OF NEW YORK

Bonnlander, J. V.	Moore, J. A.
Butzer, S. D.	Mumme, R. F.
Carlin, J. C.	Nardi, A. P.
Cronk, A. R.	Newton, K.
Denny, R. F.	Nishimoto, G. Y.
Farr, W. A.	Pitcher, J. A.
Farrenkopf, T. O.	Rawlings, D. H.
Freeman, J. V.	Rickard, W. M.
Galantowicz, R. E.	Richards, N. A.
Gustavson, R. D.	Sand, P. R.
Henninger, D. E.	Schenck, W. O.
Johnston, W. F.	Shaw, J. H.
Jurgensen, R. I.	Stolte, W. F.
Klein, J.	Stringham, J. A.
Koenig, R. R.	Tegethoff, A. C.
Landis, H. P.	Ulmer, W. G.
Manning, R. E.	Wolf, R. F.
Megahan, W. F.	Wolfe, B. H.
	Yamrick, W. F.

Member Grade

Capone, P. C., Forester, N. Y. State Cons. Dept., Lake George, N. Y.; State Univ. of N. Y., B.S.F., 1951. (Junior 1951).

Suters, P., Asst. Co. Forester, Onondaga Co. Park Board, Lafayette, N. Y.; State Univ. of N. Y., B.S.F., 1953. (Junior 1953).

Northern California Section

Junior Grade

Manning, R. A., Box 898, Redding, Calif. Reinstatement.

Member Grade

Baris, D. M., Hoopa, Calif. (Junior 1950).

Dozier, J. C., Box 835, North Fork, Calif. (Junior 47R55).

Macpherson, W. R., P. O. Box 17, Orick, Calif. (Junior 1950).

Nicklos, J. F., 524 56th St., Sacramento, Calif. (Junior 1950).

Thomas, W. D., Calif. Spray Chemical Corp., Ortho Way & Lucas Ave., Richmond, Calif. (Junior 1950).

Northern Rocky Mountain Section

Student Grade

MONTANA STATE UNIVERSITY

Eberle, D. E.

Junior Grade

Students Eligible for Automatic Advancement

MONTANA STATE UNIVERSITY

Behan, R. W.	Howell, H. H.
Billheimer, C. S.	Johnson, J. M.
Boll, L. A.	Laber, A. W.
Carruthers, R. V.	Laux, J. W.
Dale, R. T.	Paul, G. D.
Duft, J. F.	Rundle, R. J.
Dupuis, K. W.	Thayer, A. J.
Dyson, P. J.	Venable, R. M.
Embry, R. S.	Wakefield, S.
Flohr, D. L.	Wambach, R. F.
Gallup, R. D.	Weingart, P. D.

Ozark Section

Junior Grade

Riley, J. T., Field Asst., Int. Paper Co., Rison, Ark.; Okla. A&M, B.S., (Forestry), 1954. (Affiliate 1954).

Weaver, J., Dist. Forester, Mo. Cons. Comm., Branson, Mo. Reinstatement.

Member Grade

Wellberg, E. T., Box 460, Salem, Mo. (Junior 49R55).

Affiliate Grade

Hooker, W. V., Asst. Forester, Dierks Forest Inc., Battiest, Okla.; Okla. A&M, B.S., (Forestry), 1957.

Hooper, T. H., Forester, USFS, Booneville, Ark.; Okla. A&M, B.S., (Forestry), 1950.

Hubbard, D. S., Dist. Forester, Ark. Forestry Comm., Eldorado, Ark.; Ark. A&M, B.S., (Forestry), 1954.

Puget Sound Section

Student Grade

UNIVERSITY OF WASHINGTON

Geimer, R. L.

Junior Grade

Feind, G. W., Asst. Forester, Ketchikan Pulp Co., Ketchikan, Alaska; Colo. State Univ., B.S.F., 1951.

Students Eligible for Automatic Advancement

UNIVERSITY OF WASHINGTON

Ahearn, A. D.	Lusignan, G. R.
Anderson, D. N.	Magill, A. W.
Battig, B. J.	Mason, B. J.
Berry, W. F.	Merritt, R. O.
Chan, G. K.	Mifflin, J. M.
Graber, R. E.	Randall, A. C.
Hamon, F. E.	Steen, H. K.

Member Grade

Bandel, J. R., Land Examiner, Weyerhaeuser Tbr. Co., Tacoma, Wash.; Univ. of Minn., B.S.F., 1949. (Junior 1953).

Hays, H. E., USFS, Ketchikan, Alaska. (Junior 1950).

Johnson, W. H., 1744 Glacier Ave., Juneau, Alaska. (Junior 1950).

Poe, C. M., Assoc. Forester, Simpson Logging Co., Shelton, Wash.; Univ. of Wash., B.S.F., 1951. (Junior 1951).

Affiliate Grade

Plourd, K. H., Cons. Forester, St. Regis Paper Co., Tacoma, Wash.

Welsh, J. L., Dist. Asst., USFS, Darrington, Wash.

Associate Grade

Rhoton, G. T., Admin. Asst., USFS, Bellingham, Wash.

Southeastern Section

Student Grade

UNIVERSITY OF GEORGIA

Manning, J. F. Tanner, J. F.
Wilson, C. J.

Junior Grade

Gambrell, J. C., Sr. Forester, Rome Craft Co., Newnan, Ga.; Univ. of Fla., B.S.F., 1956.

Students Eligible for Automatic Advancement

UNIVERSITY OF GEORGIA

Manning, J. F. Tanner, J. F.

Member Grade

Brewster, P., Box 454, Cedartown, Ga. (Junior 1950).

Farr, M. W., Box 98, Greensboro, Ga. (Junior 1950).

Gibson, K. B., 210 W. Church St., Carterville, Ga. (Junior 1950).

Nelson, R. B., 1004 Highland Ave., Rome, Ga. (Junior 1950).

IMMEDIATE Service For Your Needs In —

SAFETY — CRUISING — MARKING — SCALING — MAPPING — PLANTING — FIRE FIGHTING — PRUNING — WEED AND BRUSH KILLERS — FIELD CALCULATORS — SLIDE RULES — SURVEYING.

Quality Products at Reasonable Costs.

"WILD" Theodolites—"CURTA" Hand Calculators—"BLUME-LEISS" Altimeter

The NEW Center for Complete Forestry Tools and Equipment

THE BEN MEADOWS CO.

Phone CEdar 3-2601

Box 93, N.S. Station
Atlanta 5, Georgia

Proven Service

Consulting Foresters

Professional Services Offered by
Members of the Society of American Foresters

FOREST MANAGEMENT

Topographic Mapping — Forest Development Studies
Timber Stand Maps — Forest Inventories
Land Classification — Forest Appraisals

Hammon, Jensen & Wallen
MAPPING AND FORESTRY SERVICES
660 HEGENBERGER ROAD — OAKLAND 21, CALIFORNIA
General Photogrammetric and Forestry Consulting Services

GEORGE BANZHAF & COMPANY
822 North Water Street — MILWAUKEE 2 — BRoadway 6-2082
Consultants to the Wood Using Industries

POMEROY & McGOWIN
FOREST MANAGERS
Monticello, Arkansas — Chapman, Alabama

KEITH CRANSTON, Forestry Consultant
Service to Industry — Personnel Placement
1. Listing of men available for jobs
2. Listing of jobs and employment possibilities
Leland, Mississippi — Headquarters in the Delta Hardwoods
A Southwide Professional Service

Land Surveyors — *Consulting Forest Engineers*

BELANGER and BOURGET
86 MOUNTAIN HILL, QUEBEC,
P.Q., CANADA

Forest Surveys and Inventories. Establishing of boundary lines.

Forest Management and Logging plans. Locations for Wood industries.

SOUTHERN TIMBER MANAGEMENT SERVICE, INC.

FORESTRY SERVICES FOR — *TIMBERLANDS AND TIMBER OPERATIONS*

HOME OFFICE: 209½ N. 21st St., Birmingham, Ala.
224 Peach St., McComb, Miss. — P. O. Box 124, Lyons, Ga.
404 Montgomery Ave., Sheffield, Ala. — P. O. Box 964, Auburn, Ala.

Southwestern Section

Member Grade

Aldon, E. F., Research Forester, USFS, Flagstaff, Ariz.; Univ. of Mich., B.S.F., 1952; M.S., (Cons.), 1953. (Junior 1952).

Bower, J. S., Forester, USFS, Tucson, Ariz.; Colo. State Univ., B.S.F., 1935. (Junior 1953).

Grassi, P. D., Dist. Forest Ranger, Gila Nat'l. Forest, Membres, N. Mex.; Utah State Univ., B.S.F., 1952. (Junior 1953).

Hall, W. S., Dist. Forest Ranger, USFS, Kingston, N. Mex.; Colo. State Univ., B.S.F., 1950. (Junior 1951).

Upper-Mississippi Valley Section

Student Grade

IOWA STATE COLLEGE

Bouman, L. J.

Junior Grade

Herron, W. E., Asst. Dist. Forest Ranger, USFS, Bena, Minn.; Mich. College of Mining & Tech., B.S., (Forestry Eng. Admin.), 1952. (Affiliate 1953).

Students Eligible for Automatic Advancement

IOWA STATE UNIVERSITY

Bonyata, R. J.	Perkins, J. B.
Bouman, L. J.	Pillsbury, S. S.
Daniel, P. L.	Richardson, D. E.
Dodge, R. E.	Rush, P. A.
Edgren, J. W.	Schramm, D. L.
Hazard, J. W.	Stewart, R. E.
Koning, J. W.	Uhr, S. C.
Medin, D. E.	Warner, W. R.
Omodt, D. G.	Yargus, W. O.

Member Grade

Hamilton, J. W., Research Forester, Halvorson Trees, Inc., Duluth, Minn.; Univ. of Minn., B.S.F., 1950; M.F., (Silviculture), 1955. (Junior 1951).

Hansen, N. J., Research Associate, Iowa State College, Drakesville, Iowa; Iowa State, B.S.F., 1951; M.S., (Silviculture & Soils), 1954. (Junior 1951).

Wisconsin-Michigan Section

Student Grade

UNIVERSITY OF MICHIGAN

Davis, W. H. E.

Junior Grade

Cochran, R. S., Graduate Student, Mich. State; East Lansing, Mich.; Mich. State, B.S.F., 1950.

No Section

Junior Grade

Snell, G. F., APO, N. Y. (Reinstatement).

Corresponding Grade

Gomez, J., Chief, Forestry Extension Program, State of Antioquia, Colombia, S. A.; Facultad de Agronomia e Instituto Forestal Medellin, Ing.Forestal, 1952.

Perez, C. A., Asst. Chief of Forestry, Colombian Ministry of Agric.; Yale, M.F., 1956.

Yassamy, B., Asst. to Foreign Forest Advisers, Iranian Forest Service; Indian Forest College, B.S., (Forestry), 1947.

Forestry News

AN HONOR GUARD of Pershing Rifles participated in the dedication of a memorial to Penn State and Mont Alto foresters who died in World Wars I and II.

Penn State Forestry School Has Fiftieth Anniversary

Fifty years of forestry education at Penn State University was marked by a two-day celebration at the University Park campus May 27-28. Five hundred alumni and guests attended the gathering, sponsored by the Penn State-Mont Alto Forestry Alumni Association.

Dr. Eric A. Walker, president of the University, gave the welcoming address at the general meeting, and M. K. Goddard, Pennsylvania Department of Forests and Waters, responded. Henry Clepper, executive secretary of SAF, spoke to the assembly of the "Historical Highlights of the Penn State and Mont Alto Forestry Schools."

Contributions of Penn State-Mont Alto foresters were discussed by James K. Vessey, Charles H. Flory, William C. Bramble, and Albert G. Hall.

George M. Leader, Governor of Pennsylvania, was the principal speaker at a banquet which closed the first day's activities.

Dr. Walker presented Forestry Achievement Awards to the following alumni: Henry Clepper, F. C. Craighead, G. W. Dean, G. L. Drake, E. O. Ehrhart, I. T. Haig, B. F. Heintzleman, E. W. Loveridge, A. C. McIntyre, C. A. Rishell, and Herman Work.

A feature of the morning of the second day was the dedication of an avenue of more than 170 trees planted as a memorial to alumni who gave their lives in World Wars I and II. The names of the alumni are listed on a plaque in the forestry building. Col. Herman Work delivered the dedication speech.

Mr. Ehrhart served as general chairman of the Anniversary Committee.

WILLIAM J. BOZETT
Consulting Forester
Member, Association of Consulting Foresters
Timber Management & Marketing
LOGAN OHIO

ALBERT G. HALL
Forestry Relations Counsel
Consulting Forester
Member, Association of Consulting Foresters
810 18th St., N.W., Washington 6, D.C.

FRANK J. LEMIEUX
Forester
833 WHITNEY BUILDING
NEW ORLEANS, LA.

JOHN G. GUTHRIE
Consulting Forester
BOX 517 WIGGINS, MISS.
PHONE WALNUT 8-4958

POND & MOYER CO., INC.
Consulting Foresters
Estimates—Appraisals—Surveys
Machine Tree Planting Service
107 HOMESTEAD RD., ITHACA, N. Y.

NAT'L. TIMBER CONSULTANTS
COMPLETE TIMBER SERVICES
SALEM, MISSOURI

LOGGING COST ESTIMATES APPRAISALS
SURVEYS AND MANAGEMENT CRUISING
INTERMOUNTAIN TIMBER SERVICE
Know Your Timber Values and Logging Costs
THOMAS (Tom) C. CLIFTON Tel. 2-4300
Consulting Forester 4101 State St.
Boise, Idaho

Consulting Forester Forest Surveyor
JOHN STOCK
Specializing in Adirondack Forest and Tax Problems
Box 311 Tupper Lake, N. Y.

R. B. SHANNON & ASSOCIATES
KITTANNING, PA.
REGISTERED SURVEYING
CONSULTING FORESTRY
PHOTOGRAMMETRIC
CARTOGRAPHY
Phone: Kittanning 42-4941

TIMBERLAND MANAGEMENT, INVENTORY AND APPRAISAL
—OVER 50 MILLION ACRES SINCE 1910
JAMES W. SEWALL COMPANY
FOREST ENGINEERS
OLD TOWN, MAINE
BRANCH: JAMES W. SEWALL CO. (CANADA) LTD., FREDERICTON, NEW BRUNSWICK

TIMBER MANAGEMENT SERVICE
J. E. HALL R. W. MEZGER
FORESTRY CONSULTANTS
Technical Assistance to Timberland Owners and Operators in the Ponderosa Pine Region
Klamath Falls, Oregon

NORTHERN TREE COMPANY
Professional Forestry Services
Thomas F. Schweigert, Pres.
Member, Association of Consulting Foresters
Penney Building
Petoskey Michigan

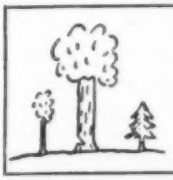
FOREST PROPERTY
Estimates—Appraisals—Management
Prentiss & Carlisle Co., Inc.
107 Court Street Bangor, Maine

WILLIAM A. EASTMAN, JR.
Consulting Forester
Complete Professional Service
SEATTLE 1, WASHINGTON
410 J. GREEN BUILDING
Phone SEneca 2814

PAUL T. WINSLOW
Consulting Forest Engineer
ESTIMATES—APPRAISALS—MANAGEMENT
STAATSBURGH-ON-HUDSON, N. Y.

Reforestation Arboriculture
S. GAYLEY ATKINSON
Consulting Forester
Huntingdon Road
Huntingdon Valley, Pa.

TREE FARM MANAGEMENT SERVICE
1166-7th Avenue, West, Eugene, Oregon
Protection—Reforestation—Inventory
Utilization—Research
Verne D. Bronson, Chief forester, Phone 5-5371


THOMAS G. CLARK,
CONSULTING FORESTER
FOREST LAND MANAGEMENT CO.
P. O. BOX 1046
MORGANTOWN, W. VA

PAUL M. SANDERS
Consulting Forester
916 YEON BLDG.
PORTLAND 4, OREGON
Telephone: CApitol 8-3536

AFA Plans 82nd Annual Meeting

Wood utilization will be the subject of The American Forestry Association's 82nd Annual Meeting at the Loraine Hotel, Madison, Wis., September 30 to October 2, 1957.

Authorities will discuss key aspects of woodland management to secure maximum yields of wood and fiber; integration of primary manufacturing plants to eliminate waste in wood residues, sawdust, and bark; new techniques in processing finished wood, paper, and chemical by-products; and the future of wood fiber in the world of tomorrow. Two days of tours and exhibits will follow the opening sessions.

The annual banquet, scheduled for Tuesday, October 1, will feature presentation of conservation awards in the fields of business and industry, education, general service, public information, and public service.

William J. P. Aberg, past director of the Wisconsin Conservation Commission, will serve as general chairman of the meeting.

H. B. Newland Replaced as Director of Forestry in Kentucky

Harrod B. Newland, for the past 23 years director of the Division of Forestry, Kentucky Department of Conservation, has been put in charge of a new state two-phase program of youth conservation training centers and increased development of forest industries. In addition, he will assist in the legislative program for statewide protection from fire.

A 1931 forestry graduate of Iowa State College, Mr. Newland entered the Division of Forestry in 1933 as assistant director, and has continuously since then served in the Division.

HARROD B. NEWLAND

The JOURNAL OF FORESTRY has been told that Newland's probable successor as director of the Division is Gene L. Butcher, former district forester at Georgetown, Ky. He is a 1949 forestry graduate of Duke University who has been with the Division for eight years.

Both Mr. Newland and Mr. Butcher are natives of the state.

Mr. Newland is a former chairman of the Society's Kentucky-Tennessee Section. He has been active in numerous other movements for the conservation of the commonwealth's natural resources.

Forest Physiology Symposium Held at Wooster

Representatives from three foreign countries and 14 states participated in the Forest Physiology Symposium held at the Ohio Agricultural Experiment Station, Wooster, Ohio, June 13 and 14.

Main speakers on the meeting program were Dr. Leonard Leyton, Oxford University, who spoke on "Mineral Nutrition" and Dr. H. A. Borthwick, Plant Industry Station, Beltsville, Md., who discussed "Light Effects on Tree Growth and Seed Germination."

The other speakers on the symposium program were Dr. B. S. Meyer and Dr. C. A. Swanson, Ohio State University; Dr. John Haeskaylo and Dr. J. D. Sayre of the Ohio Agricultural Experiment Station; and Dr. Edward Haeskaylo of Beltsville, Md.

The symposium was under the direction of the Ohio Agricultural Experiment Station's Department of Forestry which is headed by Oliver D. Diller. Papers of the meeting will be published in the *Ohio Journal of Science*.

Education

George A. Garratt Honored by Degree

Dr. George A. Garratt, dean of the Yale University School of Forestry, was awarded an honorary Doctor of Science degree June 10 at the precentennial commencement exercises of the University of the South, Sewanee, Tenn. From 1923-25 he had been professor of forestry and engineering at that institution.

Dr. Garratt's citation read in part: "In his long and honored career as teacher and dean, (he) has by personal example and professional wisdom instilled into his students those qualities which make a full and useful life.

"As an educator and administrator of proven ability he has gained leadership of national significance.

"A respected leader of integrity and high principles, he has done much to promote sound thinking and policies on the part of a large and important industry and is sought as an advisor and consultant in the fields of business and human problems.

"His technical competence has made him a recognized and outstanding Master Forester.

"As author of note, he has contributed much in expanding research in Silviculture and has been the recipient of many high state and national awards from the institutes and societies serving his chosen fields of service.

"In conferring the degree of Doctor of Science, the University of the South pays tribute to his long and distinguished career and proudly welcomes him as an alumnus."

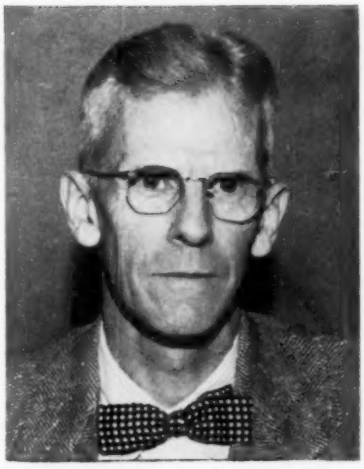
University of Maine Honors Retiring Forestry Head

Professor Robert I. Ashman, retiring head of the Department of Forestry at the University of Maine, was awarded an honorary degree, Doctor of Science, by the University at the June commencement exercises.

Professor Ashman has served as head of the department since 1946, having joined the faculty in 1930. He graduated from Cornell University in 1913 and received his MF degree in 1929 from Yale University.

Schenck Memorial Forest Dedicated

A 250-acre pine forest near Raleigh, N. C. has been dedicated to the memory of Carl Alwin Schenck, pioneer in American forestry and founder of the Biltmore Forest School. The tract belongs to the School of Forestry, North Carolina State College. As part of the dedication ceremonies the College was presented with an endowed scholarship in forestry given by alumni and friends of the old Biltmore school to be known as the Biltmore Scholarship.



Gregory Baker

Baker Named Acting Head of Maine School

Professor Gregory Baker has been appointed acting head of the forestry department at the University of Maine, effective July 1, on the retirement of Professor Robert I. Ashman.

Professor Baker was graduated from the University of Maine in 1924 with a bachelor of science degree in forestry. He did advanced work at Yale University. Joining the faculty of the University of Maine in 1935, Professor Baker has been a teaching member of the staff since that time. In 1943 he became a member of the faculty of the Maine Agricultural Experiment Station with the responsibility for research work in the field of wood utilization.

During the past few years, Professor Baker has been a member of the executive committee of the Northeast Technical Forestry Committee and a cooperator on a regional project in forest product marketing. He teaches formal courses in wood identification, wood preservation, and other phases of wood utilization.

Dr. O. F. Hall Joins Purdue Staff

On July 1, Dr. Otis F. Hall, of the University of Minnesota, joined the Forestry staff at Purdue, according to an announcement by E. R. Martell, head of the Department of Forestry and Conservation.

A native of Ohio, Dr. Hall holds degrees from Oberlin, Yale, and the University of Minnesota. Forest management and forest economics will be the field of his teaching and research at Purdue.

NORTHEAST FORESTRY SERVICE
STANLEY MESAVAGE, *Consultant*
Forest Management
Timber Production
Forest Products Marketing
HAWLEY PENNSYLVANIA

ADIRONDACK FORESTRY, INC.
David E. Strong Donald E. Peterson
Consultants
Estimates, Appraisals, Marketing
Management Plans, Tree Planting, Preservation
WILMINGTON, NEW YORK

WILLIAM H. PRICE
FOREST MANAGEMENT
Specializing in
Timber Tax Problems
2626 W. Lynn—Seattle 99, Wash.
Al der 7482

Porcius F. Crank, Jr.
Consulting Forester
Point Harbor North Carolina

The new appointment fills a vacancy left by the departure of Dr. A. M. Herrick to become dean of the Forestry School at the University of Georgia.

Private & Industrial

Forest History Foundation, Inc., President Elected

Dr. Theodore C. Blegen, dean of the graduate school of the University of Minnesota has been named president of the Forest History Foundation, Inc. His election was announced following the annual meeting of the Foundation's Board of Directors in June.

Dean Blegen succeeds Dr. Frank H. Kaufert, head of the School of Forestry at the University of Minnesota, who has served as president of the Foundation for the past two years. The newly elected president has been a member of the Foundation's governing body since its formal organization in 1946.

Allied Chemical Aids Fertilization Research at Michigan State

A cooperative research agreement between the Nitrogen Division of Allied Chemical and Dye Corporation and the Forestry and Soil Science Departments of Michigan State University has been established to support research in the fertilization of forest trees.

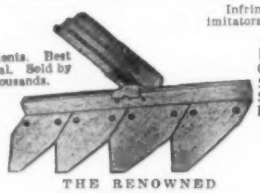
THE LOWTHER
TREE PLANTER PLANTS
10,000 SEEDLINGS PER DAY!

With the Lowther Tree Planter, trees are properly planted for maximum survival in any soil because they have been given the right start.
Three distinct models available to cover all soil conditions and terrain.

●

For details, write:

THE HARRY A. LOWTHER COMPANY
INDUSTRY AVE., JOLIET, ILL.
By The Makers Of The Famous Lowther C-Saw



THE RENOWNED
CHARLES H. RICH
"Forest Fire Fighting Tool"
Write for Prices and Descriptions
C. H. RICH FOREST FIRE TOOL CO.
218 W. Bald Eagle St.
Lock Haven, Pa.

20 MILLION
TREES A YEAR!
FREE Catalog
Evergreen Seedlings — Transplants. Fruit and Shade Trees — Shrubs and Rhododendrons
Free Christmas Tree Growers' Guide
MUSSER FORESTS, Box 26-H Indiana, Pa.

For over ten years
a dependable source
for
Southern
Pine
Seed
SOUTHERN SEED
COMPANY INC.
Baldwin, Georgia

WALTER J. FILLMORE

Investigations will be under the direction of Dr. Donald P. White, associate professor of forestry.

Initial experiments will be conducted to improve quality in young coniferous plantations of species ordinarily used for Christmas trees. Future plans include long term experiments to evaluate the effect of fertilizers and soil amendments in increasing growth and yield in pulpwood and timber stands.

Martindale Joins Ed Knapp, Consulting Forester

G. Ed. Knapp, consulting forester of Macon, Ga., has announced the addition of Donald L. Martindale to his staff.

A graduate of Michigan College of Mining and Technology in 1950, Martindale received his Master's degree in forestry from Michigan State University in 1951. For the past six years he has been employed by the U. S. Forest Service.

Knapp and Martindale are now offering all the services of a consulting forester, and contracting for all phases of forest management work from tree planting to hardwood control and timber marketing.

Public

Fillmore Appointed South Dakota State Forester

Walter J. Fillmore, district forester at Rapid City, S. Dak., has been appointed state forester for South Dakota by the Game, Fish and Parks Commission.

Fillmore succeeds Harry R. Woodward who has held the position for the past nine years, and who was promoted to assistant director of the Department of Game, Fish and Parks.

Fillmore joined the department in 1947 as assistant state forester in charge of timber management, and has held that position until recently when the Forestry Division was reorganized into districts.

He is a 1947 forestry graduate of the University of Minnesota and is a native of St. Paul, Minn. He served from 1940-1946 in the U. S. Navy, and is presently a Lt. Commander in the Naval Reserve.

Entomologist Retires

The retirement of Archie L. Gibson, Forest Service entomologist, after 37 years of Federal employment, was announced in June by Director Reed W. Bailey of the Intermountain Forest and Range Experiment Station, Ogden, Utah. Mr. Gibson was on the staff of the Missoula, Montana Forest Insect Laboratory, a field research unit of the Station. He received a Bachelor's degree in forestry at Syracuse University in 1920. His graduate studies in forest entomology were conducted at the University of Minnesota in 1926 and 1928.

Gibson has published technical papers on various forest insects. He made outstanding research contributions in the field of bark beetle biology and ecology and was one of the pioneers in the development of present-day use of bark-penetrating insecticides for the control of insects in the forests of the West. His most recent contributions were studies of the life history and habits of the Engelmann spruce beetle in northern Idaho and western Montana. Some of the results of this study were used in control efforts during the recent epidemic of this beetle which killed 2.5 billion board feet of mature spruce timber in these two states from 1952 to 1956.

He has been an active member of the Entomological Society of America, and of the Ecological Society of America.

James T. Morgan Promoted

James T. Morgan, a staff member at the Lake States Forest Experiment Station, has been appointed the new

chief of the station's Division of Forest Economics, succeeding Russell N. Cunningham who retired on May 31.

In his new position Mr. Morgan will be responsible for the current survey of forest resources in the North Central States as well as for developing new survey techniques.

Morgan graduated from the School of Forestry at the University of Michigan in 1940. He spent four years in the Army during World War II. In 1947 he obtained an M.F. degree from the University of Michigan and was then appointed to a position in forest survey work at the Central States Forest Experiment Station in Columbus, Ohio. In 1954 he was transferred to the Lake States Forest Experiment Station and assigned to the Division of Forest Economics.

F. A. Albert Retires

Assistant Regional Forester Frank A. Albert, U. S. Forest Service, Southern Region, retired in July, according to Regional Forester C. Otto Lindh. This marks the end of a 30-year career with the Forest Service.

A native of Pennsylvania, Albert received a BS degree in forestry from the Pennsylvania State University in 1926. Following graduation he served as a forest ranger in the Northeastern and Southern Regions. He went to the Southern Region in 1931, where he has held positions as district ranger; forest supervisor, Florida National Forests and Mississippi National Forests; chief of the Division of Lands, Wildlife and Recreation; and, since 1950, chief of the Division of State and Private Forestry.

On his retirement Mr. Albert has accepted the position of director of the Georgia Forest Research Council, with headquarters at Macon, Ga.

McCormack Heads Forest Economics Research at Southeastern Station

J. F. McCormack has been appointed chief of the Division of Forest Economics at the Southeastern Forest Experiment Station according to a recent announcement by Joseph F. Pechanec, director of the Station.

McCormack has been with the Forest Service since 1935 and has been a member of the staff of the Southeastern Station for the past 12 years. In his newly appointed position he succeeds James W. Cruikshank, who died suddenly May 9, 1956. He is a forestry graduate of Cornell University.

Raymond U. Harmon Retires

Raymond U. Harmon, assistant regional forester at Missoula, Mont., retired June 30, after completing nearly 36 years of service with the U. S. Forest Service, Regional Forester Chas. L. Tebbe has announced. Harmon has been in charge of lands, watershed, and recreation activities in this region since 1945.

A graduate of the New York State School of Forestry at Syracuse, Harmon joined the Forest Service in 1921. During the early thirties he was supervisor of the national forests in Wisconsin.

He was promoted in 1939 to the position of assistant regional forester for the Lake States Region with headquarters at Milwaukee, Wis. He was in charge of the Division of Lands and Recreation for three years and then in charge of the Division of Operation until his transfer to Missoula.

Intermountain Editor Named

Dr. Wendell M. Keck, professor of English at the Utah State Agricultural College, has been appointed editor of the Intermountain Forest and Range Experiment Station, U. S. Forest Serv-

PLANTING TREES ?

Use a "FORESTER" or "CONSERVATOR" Planter

UT & Co. — Builders of Dependable Equipment Since 1935

Complete information on request

UTILITY TOOL & BODY CO.

Clintonville, Wis.

PREVENT INSECT BITES WITH REPEL-PAPER

Use like cleansing tissue to repel mosquitoes, gnats, chiggers, flies. Guaranteed effective and absolutely safe; non-toxic, non-irritating. *At dealers everywhere.*

Orchard Paper Co. • St. Louis 15, Mo.

10 Reusable Sheets in Plastic Pouch

25¢

Photogrammetric

STEREOSCOPES - STEREOMETERS

SKETCHERS - PLOTTERS

HARRISON C. RYKER, INC.

1209 - 8th Ave. Oakland, Calif.

Make These 3 FOREST'S

WORKHORSES

WORK FOR YOU—FZZ•FZ•HPZF

These 3 HALE Centrifugal Portable Pumping Units can give you the range of volumes and the pressure you need for a wide variety of fires.

All three "Workhorse" units are conveniently portable by two men; can be easily mounted or carried on any type of apparatus or truck for fighting fires while in motion from booster tank; often used to pump from inaccessible water source into major pumper, or to fight fires direct through long lines of hose.

	U. S. Gallons Per Minute	Disch. Press. Lbs. Per Sq. In.
*FZZ	60	90
	100	70
FZ	50	60
	300	10
HPZF	15	200
(Pictured in action above)	45	100

*FZZ now has NEW—Ball-Type Discharge Valve—Improved Priming

Write today for circulars. Ask for a Demonstration; no obligation.

HALE FIRE PUMP COMPANY

Conshohocken, Pa.

INDEX TO ADVERTISERS

	Page
Adirondack Forestry, Inc.	621
Aermotor Company	609
Atkinson, S. Gayley	620
Banzhaf, George & Co.	618
Bartlett Mfg. Co.	612
Bearer, V. M.	609
Belanger & Bourget	618
Blue Jet Corporation	604
Bozett, William J.	619
Caterpillar Tractor Co.	3rd Cover
Clark, Thomas G.	620
Clifton, Thomas C.	619
Crank, Porcius F. Jr.	621
Cranston, Keith	618
Dow Chemical Co.	562
Eastman, Wm. A. Jr.	620
Fechheimer Bros. Co.	606
Forest Farmers Assn.	616
Forest Seeds of Calif.	609
Forestry Suppliers, Inc.	607
Guthrie, John G.	619
Hale Fire Pump Co.	623
Hall, Albert G.	619
Hammon, Jensen & Wallen	618
Homelite Corporation	4th Cover
Keene Forestry Assn.	615
Kurfew, Inc.	606
Lemieux, Frank J.	619
Lind, A. L. Co.	615
Lowther, Harry A. Co.	622
Lufkin Rule Co.	613
McCurdy Bros., Nurseries	609
Meadows, Ben	617
Meyer, Mrs. H. Arthur	615
Motorola	608
Musser Forests, Inc.	622
Nat'l Timber Consultants	619
Nelson Company	605
Northeast Forestry Service	621
Northern Tree	620
Orchard Paper Co.	623
Oregon State Tax Commission	624
Pacific Weather Service	609
Paint Creek Nurseries	615
Panama Pump Co.	610
Pomeroy & McGowin	618
Pond & Moyer	619
Prentiss & Carlisle	620
Price, William H.	621
Rich, C. H., Forest Fire Tool Co.	622
Rootspred Tree Planter	610
Ryker, Harrison C., Inc.	623
Sanders, Paul M.	620
Sandvik Steel, Inc.	613
Schultz, C. D. Co., Inc.	612
Sebrell, J. B. Corp.	606
Sewall, James W. Co.	619
Shannon, R. B.	619
Silva, Inc.	609
Smith, D. B., Co.	2nd Cover
Southern Coatings	614
Southern Seed Co.	622
Southern Timber Mgmt. Service	618
Stock, John W.	619
Suncrest Evergreen Nurseries	606
Timber Mgmt. Service	620
Tree Farm Mgmt. Service	620
Utility Tool & Body Co.	623
Western Fire Equipment Co.	611
Winslow, Paul T.	620

ice, Reed W. Bailey, director, announced today. Dr. Keek has been a collaborator with the Experiment Station for the past two years, and had served as collaborator with Region Four of the Forest Service prior to that. His report on written communications in the U. S. Forest Service, issued in 1953 after extensive study at Region Four headquarters in Ogden, Utah was widely distributed and received commendation from the chief of the Forest Service.

Supervisor Promoted

Edward F. Barry, supervisor of the Lolo National Forest, has been promoted to the position of assistant regional forester of the Northern Region, U. S. Forest Service, with headquarters at Missoula, Mont.

In assuming his new duties on July 1, Barry took charge of land use planning and coordination, recreation, special uses, watershed management, and mining activities. He succeeds Raymond U. Harmon who retired June 30.

Barry was appointed supervisor of the Lolo National Forest in December 1954.

W. T. Doolittle Assigned to Washington Position

Warren T. Doolittle, after 11 years' service at the Southeastern Forest Experiment Station, was recently appointed to a position in the Division of Forest Management Research in the Washington office of the U. S. Forest Service. He was replaced at the Asheville, N. C. Station by Paul C. Builkey who has for the past three years been research forester with the Lower Peninsula Research Center, East Lansing, Mich. branch of the Lake States Forest Experiment Station.

V. N. Stokes Appointed to Regional Staff

Victor N. Stokes has been appointed assistant to the chief of the Division of Range and Wildlife Management in the regional office of the Forest Service in Missoula, Mont. He succeeds Jack Curtiss who was recently promoted to a position in the Forest Service's Washington office.

Stokes has been assistant forest supervisor of the Fishlake National Forest at Richfield, Utah since 1950.

Forestry Employment

S.A.F. members are privileged to insert one 60-word advertisement in this column without charge. Forest industries desiring to employ foresters may insert advertisements at the rate of $4 per column inch. Copy must be received by the end of this month for an advertisement to appear in the issue after next.

Obviously, the Society cannot assume responsibility beyond making it possible for prospective employee and employer to enter into negotiations.

Positions Available

VALUATION FORESTERS

The Oregon State Tax Commission through expansion of its timber valuation section has permanent career forester positions available for graduate foresters. Opportunity to gain valuable experience in this program of inventorying and determining the valuation of Oregon's most important natural resources.

Write to:
PERSONNEL DIVISION
OREGON STATE TAX COMMISSION
SALEM, OREGON

Positions Wanted

Forester, 41 years old, M.F., Yale, seeks executive position or challenging "pioneering" work in central or north-central states. 20 years in state and private forestry and public relations. Married, 3 children. Now earning $7,000.
Box U, Journal of Forestry, Mills Building, Washington 6, D. C.

Graduate forester. Age 47, married, 3 children, veteran. Eight years experience with U. S. Forest Service and twelve years in private forestry. Considerable experience in land management, land acquisition, and logging operations in Lake States where position is desired, but will consider other locations.
Box V, Journal of Forestry, Mills Building, Washington 6, D. C.

Graduate forester, age 34. Diversified forestry experience in eastern United States, including 7 years federal government and 6 years private industry in forest management, logging, portable sawmilling and chipping, appraisal, acquisition and plant location surveys, pulpwood procurement, engineering and cost estimating. Privately employed at present. Desire position offering advancement opportunity and use of abilities.
Box W, Journal of Forestry, Mills Building, Washington 6, D. C.

University of Washington graduate with Business Administration and Forestry combination. Age 26, married, veteran. Two years and several summers experience in logging engineering, equipment and parts purchasing, and cost control for a medium sized timber company. Presently working as logging engineer and assistant road construction superintendent. Prefer position abroad with opportunity for advancement. Will also consider job in products or sales.
Box X, Journal of Forestry, Mills Building, Washington 6, D. C.

Forester, B.S.F., New York State College of Forestry 1949. Age 38, married, three children. Over seven years experience with tree expert company. Experienced in municipal tree removal, brush spraying, tree spraying, telephone line trimming, and private tree surgery. Desire location in central New York, but will consider others. Member New York State Arborists Association.
Box Y, Journal of Forestry, Mills Building, Washington 6, D. C.

Forester—B.S. (Forest Mgt.), 1950. Married, 1 child, veteran. 6 years experience in cruising, type mapping, drafting. Particularly familiar with Ponderosa Pine areas of the West. Desire permanent position in any Western state.
Box Z, Journal of Forestry, Mills Building, Washington 6, D. C.

MORE WORK —faster and cheaper!

Slash disposal and stand improvement job in the Missoula District of Lolo National Forest, Montana, efficiently handled by Caterpillar D6 Tractor

Howard E. Long, Clinton, Montana, won a contract with the Forest Service to pile slash and scarify the ground for reseeding in an area that had been logged during the spring.

Here you see him and his CAT* D6 Tractor with brush rake at work. On most occasions, he was able to handle several chores at one time—piling slash and culled logs, pushing over and piling snow-damaged and diseased fir and scarifying the ground for natural reseeding of ponderosa pine. The power and maneuverability of the D6 helped him do fast, careful work around the mature pines which had been left as seed trees. In all, he covered more than 113 acres, at a cost to the district of only $1575.

Whether the job is slash disposal, stand improvement, building access roads or firebreaks or fighting fires, you can depend on this: You'll get full value from a Caterpillar Diesel Tractor. From the 3¾-ton, 48 HP D2 to the 29-ton, 320 HP D9, each unit is ruggedly built to do *more* work at *lower* cost with *less* down time than any other machine it its power range. Want to see facts and figures that *prove* this? Just call your Caterpillar Dealer—he'll be glad to show them to you!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

MODERN HEAVY-DUTY WOODS EQUIPMENT

WIN A FREE HOMELITE Chain Saw EVERY YEAR FOR LIFE!

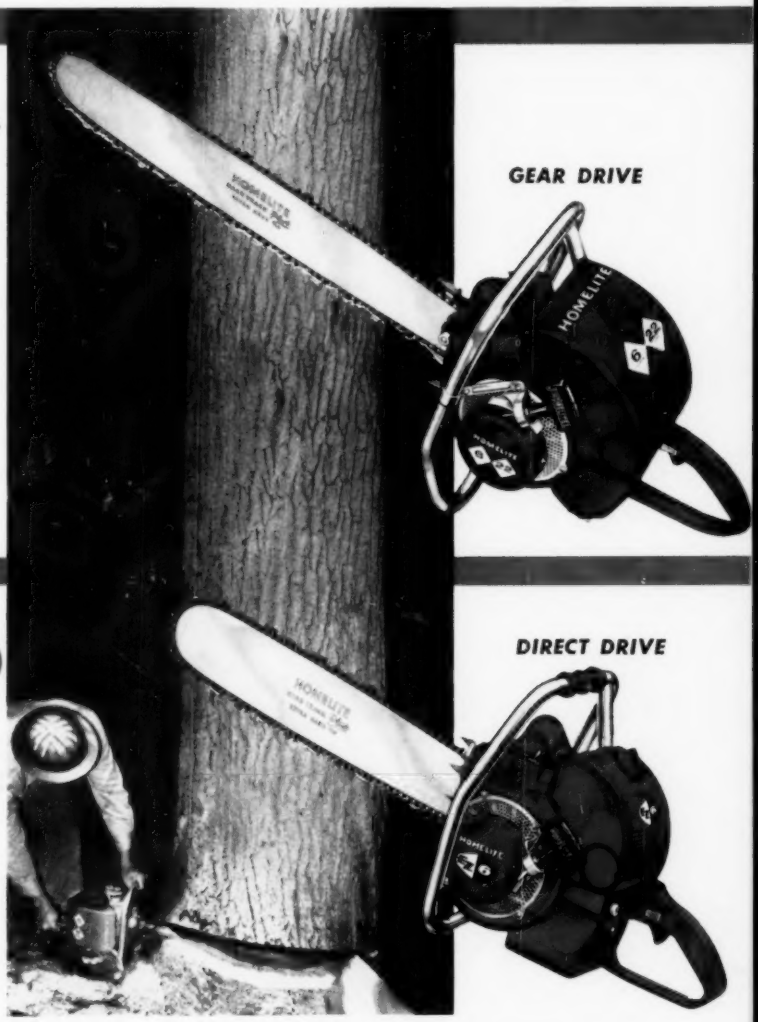
Register Now in the big New Homelite "Power Twins" Contests!

You may have three chances to win! Grand Prize — a free Homelite chain saw every year for life, PLUS 25 chain saws being given free by Homelite District Offices, PLUS hundreds of chain saws being awarded by Homelite dealers in their own local contests!

Nothing to buy, nothing to write, no obligation! Just have a free demonstration of the new Homelite 6-horsepower Power Twins at your nearest Homelite dealer. Fill out the entry blank and you're automatically registered for all the awards. Do it today! Limited to United States residents. Subject to local, state, county and city laws.

6 Horsepower 22 Pounds

You get top production in the big trees with the new Homelite 6-22. The 6 full horsepower packed into only 22 pounds has the lugging power to bring down trees up to 7 feet in diameter, cut through 20″ trees in 18 seconds. And you get more profitable cutting because the famous Homelite short-stroke, high-compression engine stands up under the grind day in and day out with less maintenance, less down-time. Money-saving attachments let you convert quickly from straight blades to plunge-cut bow, brush-cutter or clearing bar.



6 Horsepower 19 Pounds

Fastest-cutting direct drive chain saw made, the EZ-6 makes quick work of trees up to 5 feet in diameter. Zips through 8″ oak in 4 seconds, 18″ pine in 14 seconds. Light weight and perfect balance make the EZ-6 easy to handle and operate for all types of cutting . . . felling, notching, limbing, topping, buckling. Cuts in any position. Easily converted to 14″ plunge-cut bow for pulpwood production.

HOMELITE
A DIVISION OF TEXTRON INC.

4108 RIVERDALE AVE., PORT CHESTER, NEW YORK

Manufacturers of carryable pumps, generators, chain saws, blowers
In Canada: Terry Machinery Co., Ltd.

Find Your Homelite Dealer In The "Yellow Pages"

Homelite builds and sells more chain saws than any other company in the world.